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HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM

SIXTH ANNUAL REPORT OF THE SECRETARY OF TRANSPORTATION

TO THE

CONGRESS OF THE UNITED STATES

IN COMPLIANCE WITH

SECTION 144(i) OF TITLE 23,
UNITED STATES CODE

OCTOBER 1985

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SENATE RESOLUTION 181 SUBMITTED BY MR. STAFFORD OF VERMONT

In the Senate of the United States, September 26 (legislative day, September 23), 1985

Resolved, That the annual report of the Secretary of Transportation to the Congress of the United States in compliance with section 144(i) of title 23, United States Code entitled "Highway Bridge Replacement and Rehabilitation Program, Sixth Annual Report to Congress" be printed as a Senate document.

SEC. 2. There shall be printed three hundred additional copies for the use of the Committee on Environment and Public Works.

Attest:

JO-ANNE L. COE,
Secretary.

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PREFACE

In 1982, Congress acknowledged the seriousness of our Nation's bridge needs by continuing the Highway Bridge Replacement and Rehabilitation Program (HBRRP). The Surface Transportation Assistance Act (STAA) of 1982 increased funding for the HBRRP to record levels and changed the governing legislation for the program in a number of other ways as well.

The STAA authorized funding for the HBRRP through FY 1986. With this authorization limit in mind, the FHWA undertook a top-level management review in FY 1984 of the entire federal-aid bridge program. The purpose of the review was to evaluate the current bridge program, determine its strong points and weaknesses, and develop recommendations, both administrative and legislative, for program improvements. The second part of this report includes a summary of our findings.

OBJECTIVE OF REPORT

Section 144(i) of Title 23, U.S. Code, requires an annual report to Congress on the HBRRP, the status of the National Bridge Inventory (NBI), and recommendations for program improvement.

The objective of the Sixth Annual Report is to describe in detail the progress made in administering the HBRRP through December 31, 1984. The report will also discuss the status of bridge inventories for both federal-aid and off-system highways.

PART I

SPECIAL BRIDGE REPLACEMENT PROGRAM

Congress began the Special Bridge Replacement Program (SBRP) in 1970 and made available a total of $816.5 million through FY 1978. In all, 1,596 bridges have been approved for design and/or construction. Although all SBRP funds have been obligated for several years, small amounts continue to become available for reobligation in individual States when they complete ongoing projects and determine final costs. The SBRP will expire when all projects using these funds are closed out.

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM

The 1978 STAA replaced the SBRP with the HBRRP and authorized a total of $4.2 billion for FY's 1979 through 1982. The 1982 STAA continued the HBRRP and authorized $7.05 billion for FY's 1983 through 1986 in order to continue improving bridges on public highways throughout the Nation. The FHWA's Washington Headquarters administers the HBRRP through organizational channels.

Appendix A of this report contains current regulations for the HBRRP funding program. Appendix B contains the National Bridge Inspection Standards (NBIS), which implement the requirements for bridge inspection and inventory. The FHWA continues to evaluate the HBRRP regulations and the NBIS for changes to simplify procedures and improve the cost-effectiveness of the bridge programs.

The HBRRP is divided into two categories: (1) apportioned funds which are distributed according to relative State needs, and (2) discretionary funds which are set aside for use by the Secretary of the Department of Transportation (DOT) to replace or rehabilitate deficient, critically needed, high-cost bridges on

the Federal-aid system. The federal share is 80 percent of eligible project costs for both categories.

Apportioned Bridge Funds

Under Section 121 of the 1982 STAA, each State's apportionment factor is revised annually in view of changing needs and actual construction costs. To establish the apportionment factor, the FHWA applies construction costs to the four categories of eligible deficient bridge projects in each State. These categories are: 1) replacement of Federal-aid system bridges; 2) replacement of off-system bridges; 3) rehabilitation of on-system bridges; and 4) rehabilitation of off-system bridges. The ratio of each State's need to the national need is the apportionment factor. Each State must receive at least 0.25 percent but not more than 10 percent of the total funds available.

Discretionary Bridge Funds

Discretionary bridge funds finance Federal-aid system bridges which have an estimated replacement or rehabilitation cost exceeding $10 million, or less than $10 million but more than twice the amount apportioned to the State in the year funds are requested. The FHWA uses proposed funding schedules submitted by the States for candidate bridges to establish master funding plans. The plans are revised annually, or more often if necessary, using the latest data furnished by the States.

The 1982 STAA directed the Secretary of Transportation to develop a regulation on the selection of discretionary bridge projects. The regulation, which went into effect December 17, 1983 (see Appendix C), includes a formula resulting in a rating factor based on criteria included in the legislation. The process

gives funding priority to discretionary bridge projects already begun under the program. In addition, candidate bridges not previously selected and having a computed rating factor of 100 or less will be eligible for consideration.

The current discretionary bridge planning list includes 220 bridge projects which the States have submitted as candidates for replacement or rehabilitation (189 with rating factors of 100 or less). The 220 projects would cost an estimated $6.2 billion and would require $5.0 billion in discretionary bridge funds (80 percent of eligible costs) if fully funded from the discretionary bridge category. The 189 eligible projects are estimated to cost a total of $5.4 billion and require about $4.3 billion in discretionary bridge funds. All candidates submitted by the States are included in the planning list even though some unfunded projects are not eligible under the new regulation. Further, discretionary bridge funds have not yet been requested for other projects which are still in the planning stages.

As of December 31, 1984, the DOT had selected 80 of the 220 bridge projects for funding (see Table 3). Considering that $1.4 billion has been allocated through FY 1985 for these 80 bridges and that approximately $600 million more in Federal funds will be required to complete them, we estimate that another $3.0 billion in Federal funds would be needed for the remaining 140 candidates.

Individual State requests vary yearly as candidate projects advance in priority or are delayed. Additional projects will be submitted for the program as existing bridges continue to age and deteriorate to the point that rehabilitation or replacement is required.

Program Status

The table on page 6 shows how the status of the Nation's bridges has changed

since the Fifth Annual Report. This table is based on the NBI, which is essentially complete. A few local government agencies have still not inventoried, inspected, or rated the carrying capacity of bridges under their jurisdiction. The FHWA is working with these few isolated agencies to convince them of the benefits of the inspection program.

Each year, the FHWA asks the States to update the NBI as the required inventory and inspection program continues for all public highway bridges. Many States submit periodic updates, either in the form of a complete inventory or data for individual bridges. The total number of highway bridges, the number on the different systems, and the number of deficient bridges will continue to fluctuate with each annual report due to the ongoing inspection program, highway system changes, construction of new bridges, HBRRP projects, and demolition or closing of others (see Table 4).

Presently, 236,000 bridges in the NBI are eligible for HBRRP funding. This amounts to about 41 percent of the Nation's 574,100 inventoried highway bridges. Each year, newly deficient bridges are being added to the eligible list at about the same rate as bridges are being removed from the list through repair and rehabilitation. Thus, the HBRRP program, as currently funded, is just keeping pace with accruing bridge needs. It is not economically feasible or practicable to improve all 236,000 bridges classified as deficient nor is it necessary to do so from a safety standpoint. Alternative measures to allow some deficient bridges to safely remain in service indefinitely will be discussed later in this report. Still, if the Nation's highway bridges are to be maintained in a safe and serviceable condition, a significantly scaled back bridge program will not be possible in the foreseeable future.

STATUS OF THE NATION'S BRIDGES

	Fifth Annual HBRRP Report as of December 31, 1983		From NBI December 31, 1984	
	Federal-aid	Off-system	Federal-aid	Off-system
Number of bridges inventoried and classified	267,032	304,214	267,657	306,388
Number of structurally deficient bridges* (includes closed bridges)	30,996**	105,351**	33,389**	107,419**
Number of functionally obsolete bridges*	41,253**	80,706**	41,809**	77,558**
Number of bridges that are load posted***	16,922	73,106	18,524	79,832
Additional bridges that should be load posted***	14,069	52,459	10,947	38,558
Total oridges that are or should be load posted***	30,991	125,565	29,471	118,390
Number of bridges closed to all traffic (these bridges may be closed temporarily for repairs or closed permanently)	466	3,187	652	3,842
Total number of bridges funded under the bridge programs SBRP	1,606		1,596	
HBRRP	7,774	5,803	10,479	7,767
Total	9,380	5,803	12,075	7,767
Number of replaced or rehabilitated bridges now open to traffic (SBRP & HBRRP)	3,925	2,136	5,184	3,174
Bridges under construction and/or design (SBRP & HBRRP)	5,455	3,667	6,891	4,593

* A structurally deficient bridge, as defined by FHWA, is one that (1) has been restricted to light vehicles only, (2) is closed, or (3) requires immediate rehabilitation to remain open; a functionally obsolete bridge is one on which the deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance, or approach roadway alignment no longer meet the usual criteria for the system of which it is an integral part. See page 7 for breakdown.

** The number of deficient bridges (structurally deficient and functionally obsolete) reflects the FHWA's interpretation of the States' inventory data for this program, and may not agree with the States' records for these two categories. See pages 56 and 57 for breakdown.

*** Bridges that are or should be load posted include both structurally deficient and functionally obsolete bridges. The structurally deficient bridges are those which have deteriorated to the extent they cannot carry the load for which they were designed. The functionally obsolete bridges are in good condition but the original design load is lower than the current State legal load.

The FHWA uses NBI data furnished by the States to identify structurally deficient and functionally obsolete bridges - the two general classifications of deficient bridges. Structurally deficient bridges, as defined by FHWA, are those which have been: (1) restricted to light vehicles only, (2) closed, or (3) require immediate rehabilitation to remain open. Functionally obsolete bridges have deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance, or approach roadway alignment which no longer meets the usual criteria for the system of which they are a part. Most structurally deficient bridges are functionally obsolete as well. However, they would only be counted as structurally deficient because this is the more critical category of the two. The following two tables show the number of bridges by types of deficiency.

Bridges counted under multiple deficiencies have two or more of the deficiencies noted. These bridges are not included in the count of singular deficiencies.

STRUCTURALLY DEFICIENT

System	Deck	Super-Structure	Sub-Structure	Culvert of Bridge Length	Overall Structural Condition	Waterway Adequacy	Multiple Deficiencies
Interstate	1,370	201	360	33	36	20	754
Primary	2,271	1,095	1,701	164	605	135	4,380
Secondary	1,326	1,258	2,018	166	1,964	323	7,435
Urban	986	705	666	53	296	90	3,018
Total Federal-aid	5,953	3,259	4,745	416	2,901	508	15,607
Off-system	4,620	8,891	9,456	536	25,540	1,524	56,852
Total	10,573	12,150	14,201	952	28,441	2,032	72,459

FUNCTIONALLY OBSOLETE

System	Structurally Inadequate	Deck Geometry	Underclearances, Vertical & Horizontal	Waterway Adequacy	Approach Roadway Alignment	Multiple Deficiencies
Interstate	189	2,519	1,298	25	38	350
Primary	1,185	9,496	961	267	364	1,766
Secondary	1,789	10,813	176	467	1,071	3,833
Urban	557	2,859	714	111	276	735
Total Federal-aid	3,720	25,661	3,149	850	1,749	6,684
Off-system	7,089	44,934	902	1,819	2,808	20,406
	10,809	70,595	4,047	2,.59	4,557	27,090

The number of structurally deficient bridge decks continues to increase significantly on the Federal-aid primary system, including the Interstate System. The main cause of concrete deck deterioration is corrosion of the reinforcing steel accelerated by the presence of deicing chemicals. New and replaced bridge decks are now built with deck protective systems. These systems, coupled with improved construction practices, will prolong deck life. However, protection, rehabilitation or replacement of all existing unprotected bridge decks is not economically feasible in the immediate future. Therefore, bridge owners must establish priorities for developing bridge projects within the limits of available bridge program funds.

The NBI contains over 242,000 bridges, both on and off the Federal-aid systems, with an inventory load rating of 15 tons or less. The inventory load rating is the load level at which vehicles can use an existing structure for an indefinite period without affecting structure life. These 242,000 bridges equal 42 percent of the national total of over 574,000 bridges. This number is significant because bridge components experience a significant reduction in fatigue life when they are used by vehicles operating with loads exceeding the inventory rating capacity.

The fact that a bridge is "deficient," either structurally or functionally, does not imply that it is unsafe. With proper load posting and enforcement, many structurally deficient bridges can continue to serve most traffic. Functionally obsolete bridges often have geometric deficiencies which can be minimized by the use of roadway striping, signs, signals, and crash cushions.

An analysis of current Federal-aid and off-system bridge data shows that 260,175 bridges are structurally deficient or functionally obsolete. Of these, 75,198 are on the Federal-aid system and 184,977 are off-system bridges. Approximately 10 to 20 percent of all deficient bridges will not be included in the States' future work plans because of the low priority which the States assign to these bridges.

Changes in the Number of Structurally Deficient Bridges

In 1984, using Federal, State and local funds, highway agencies were able to improve 10,605 structures to the point that they are no longer structurally deficient. This figure compares with 8,325 in 1983. In addition, another 1,300 bridges previously classified as structurally deficient were removed from the NBI as the result of replacement, removal or system realignment. The upgrading of this large number of high priority, structurally deficient bridges is a strong indication of the importance State and local governments place on the bridge program.

For the 10,605 bridges which can be identified, the following table shows the types of structural deficiencies improved on each system. Because some bridges had multiple deficiencies, each structure can be listed in several deficiency categories and the figues do not equal the "total."

BREAKDOWN OF STRUCTURALLY DEFICIENT BRIDGES IMPROVED

System	Total Number of Bridges Improved	Deck	Super-Structure	Sub-Structure	Culvert of Bridge Length	Overall Structural Condition	Waterway Adequacy
Interstate	340	207	66	112	20	17	1
Primary	1,034	579	424	492	22	175	13
Secondary	1,288	630	716	661	20	542	61
Urban	375	194	167	124	12	86	3
Total Federal-aid	3,037	1,610	1,373	1,389	74	820	78
Off-System	7,568	2,336	3,284	2,458	77	3,656	320
Total	10,605	3,946	4,657	3,847	151	4,476	398

During 1984, 16,400 bridges in the NBI were reclassified as structurally deficient. Considering that we have improved 10,605 structurally deficient bridges, the number of structurally deficient bridges on the Federal-aid systems increased 8 percent (up 2,400) and off the system increased 2 percent (2,100).

Of the 16,400 newly classified structurally deficient bridges, 53 percent of the on-system bridges (3,250) and 58 percent of the off-system bridges (6,014) are more than 40 years old. Further, 19 percent of the on-system bridges (1,158) and 50 percent of the off-systems bridges (5,155) are either posted or closed. Of the 16,400 structures, 9,200 of them had been classified as functionally obsolete in 1983. This progressive deterioration reduced the total number of functionally obsolete bridges by more than 4,500 from the 1983 count. Therefore, although the number of structurally deficient bridges increased, the decrease in functionally obsolete bridges resulted in a net decrease in the total number of deficient bridges between 1983 and 1984.

Sufficiency Rating

The FHWA, in consultation with the States, establishes general bridge priorities by assigning a sufficiency rating to each bridge inventoried. The lower the sufficiency rating, the higher the priority for replacement or rehabilitation. The sufficiency rating is based on the following general categories and relative percentages:

55 percent	- structural adequacy and safety
30 percent	- serviceability and functional obsolescence
15 percent	- essentiality for public use
100 percent	

from the States' inventory data, the FHWA compiles the HBRRP selection list for each State. The list includes all deficient bridges with a sufficiency rating of 80.0 or less. All bridges on the selection list are eligible for rehabilitation. All bridges with a sufficiency rating less than 50.0 are also eligible for replacement. The FHWA recommends that the States, in developing bridge projects, consider the rehabilitation alternative, before deciding to replace a structure.

Some bridges are deficient because of superstructure or substructure conditions or a combination of deficiencies. In general, these bridges would be considered more critically deficient than those with single geometric deficiencies and would normally have a lower sufficiency rating.

The sufficiency rating is a good tool for program administration and establishes general bridge priorities. However, when evaluating bridges, setting priorities, and selecting projects on rural roads with low traffic volumes, the States should also consider other factors, such as school bus routes, availability of other access, projected traffic, and proposed roadway improvements.

The FHWA encourages States to develop bridge ranking and project selection procedures. Bridges from the selection list of eligible projects should be ranked according to the sufficiency ratings and other factors which reflect State needs, allow local input, and ensure a fair and equitable distribution of funds throughout the State. The States should also continue giving special consideration to bridges that do not meet current load capacity requirements but are otherwise in good condition.

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Estimating National Bridge Needs

Using bridge cost estimates which the States submitted to the NBI, the FHWA has determined a nationwide average cost per bridge for each highway system for: (1) bridge replacement and (2) rehabilitation. These averages were used to estimate national deficient bridge costs. The following table estimates the cost to replace or rehabilitate the eligible deficient bridges to meet current standards:

ESTIMATE TO REPLACE OR REHABILITATE DEFICIENT BRIDGES

Costs Include Federal and State Shares

System	Bridges Eligible for Replacement or Rehabilitation (Sufficiency Rating < 50)	Estimated Replacement Cost (in Billions)	Bridges Eligible for Rehabilitation (Sufficiency Rating 50 - 80)	Estimated Rehabilitation Cost (in Billions)	Total Cost (in Billions)
Interstate	540	$ .4	3,698	$ 2.1	$ 2.5*
Primary	8,070	6.6	12,403	4.8	11.4
Secondary	13,934	4.8	14,921	2.1	6.9
Urban	4,302	4.3	4,968	2.2	6.5
Total	26,846	$16.1	35,990	$11.2	$27.3
Off-system	120,164	17.2	53,015	3.8	21.0
Total	147,010	$33.3	89,005	$15.0	$48.3*

* Interstate bridge needs are eligible for funding under the Interstate Resurfacing, Restoration, Rehabilitation and Reconstruction Program.

The estimated cost to replace or rehabilitate all deficient bridges has increased since the last report. The number of eligible deficient bridges decreased; however, eligible Interstate, primary and urban system bridges (usually more costly

than secondary or off-system bridges) increased in number. Another reason the estimated cost went up is that the States reported increased bridge replacement costs in their latest NBI submissions.

These increases in eligible deficient bridges and total cost to bring all bridges up to current standards direct attention to the need to establish realistic short- and long-term goals and to redefine the Federal role in the overall bridge program. These subjects are discussed in more detail in the second part of this report.

For the purposes of estimating costs, the FHWA assumes that bridges with sufficiency ratings less than 50 will be replaced. In practice, though, some of the bridges with ratings below 50 will be rehabilitated, not replaced, while others, because of funding limitations, will be neither rehabilitated nor replaced. Similarly, many of the bridges eligible only for rehabilitation will not be rehabilitated, while others may eventually be replaced (if their sufficiency ratings decrease to below 50).

In short, the figures provided are our best estimate of the cost of upgrading every deficient bridge to acceptable standards. This estimate does not mean every bridge needs immediate attention. Many projects can be deferred. Indeed, the States must select projects within the limits of available funds. Again, part two of this report will present some suggestions for sharpening the focus of the Federal role and establishing priorities for bridge improvements.

Not all bridges in the NBI classified as deficient are eligible for the HBRRP. For example, bridges funded for construction have been removed from the eligible list even though the existing bridges will remain in the NBI as deficient until

removed by the State, usually after the structure is demolished, rehabilitation is completed or traffic transferred to the new bridge. Another large number of deficient bridges are not eligible for the program because their sufficiency ratings are above 80. The deficiencies identified for these bridges have only a very minor effect on the sufficiency rating. Presently, 236,000 bridges in the NBI are eligible for HBRRP funding.

Status of Funds

Congress has authorized the following funds for the HBRRP:

	FY's 1979-82 (Million)	FY 1983 (Million)	FY 1984 (Million)	FY 1985 (Million)
Secretary's discretionary funds	$ 800	$ 200	$ 200	$ 200
Apportioned funds excluding HPR* funds (See Tables 1A - 1C)	3,116	1,347	1,407	1,510
Acceleration of bridge projects	200	0	0	0
Administration	84	32	17	17
HPR funds**	0	21	21	23
Special Funding (Eugene Talmadge Memorial Bridge)	0	0	5	0
Totals	$4,200	$1,600	$1,650	$1,750

* HPR = Highway Planning and Research. The 1982 STAA required that 1-1/2 percent of apportioned bridge funds, as well as the apportioned Federal-aid systems funds, be deducted for highway planning and research.

** These funds are the amounts derived from bridge funds; however, they are to be used for planning and research related to highways as well as bridges.

From FY 1979 through FY 1984, the States obligated a total of $6,398.3 million of HBRRP funds. This amount was approximately 90.7 percent of the total discretionary and apportioned funds available (compared with the 85.7 percent shown in the fifth annual report). The States obligated an additional $261.3 million during the first quarter of FY 1985. The $2.5 billion obligated in FY 1984 ($1.75 billion HBRRP and $.75 billion of other Federal-aid funds) was for work on approximately 6,300 bridges. This includes both new projects and continuation of some previously funded projects. The following tabulation shows discretionary and apportioned fund obligations:

HBRRP OBLIGATIONS BY FISCAL YEAR

Fiscal Year	Secretary's Discretionary Fund (Million)	Apportioned Funds (Million)	Total Funds Obligated (Million)
1979	$ 178.9	$ 423.4	$ 602.3
1980	140.6	619.4	760.0
1981	164.4	730.8	895.2
1982	233.4	744.9	978.3
1983	216.2	1,196.0	1,412.2
1984	238.1	1,512.2	1,750.3
1985 (1st qtr.)	4.8	256.5	261.3
Total	$1,176.4	$5,483.2	$6,659.6

As noted in the following table, the States are using a large share of apportioned and discretionary HBRRP funds on their primary system bridges. This is appropriate because the primary system carries a higher volume of traffic than the other systems, is interstate in nature, and is vital to national defense.

COMPARISON OF ELIGIBLE DEFICIENT BRIDGES AND HBRRP OBLIGATIONS BY SYSTEM

System	Total No. of Bridges	Eligible Deficient Bridges	% of Eligible Deficient Bridges	Obligated* Funds (Million)	% of Total Obligated Funds
Interstate	50,721	4,238	1.8	$ 76.7	1.2
Primary	91,770	20,473	8.7	2,968.7	44.6
Secondary	91,282	28,855	12.2	1,174.9	17.6
Urban	33,884	9,270	3.9	1,285.9	19.3
Total Fed.-aid	267,657	62,836	26.6	$5,506.2	82.7
Off-system	306,388	173,179	73.4	1,153.4	17.3
Total	574,045	236,015	100.0	$6,659.6	100.0

* Including Discretionary Bridge Funds

Section 144(g)(2) of Title 23, U.S. Code, requires the States to use at least 65 percent of each year's HBRRP apportionment on Federal-aid system bridges (see Tables 1A and 2A). Additionally, the States must use no less than 15 percent of each year's apportionment on bridges off the Federal-aid systems (see Tables 1B

and 2B). Thus, 20 percent of each State's HBRRP apportionment may be used on or off the Federal-aid systems at the discretion of the State (see Tables 1C and 2C).

The States are using some apportioned HBRRP funds to continue projects begun with SBRP funds. The table on page 6, which shows a decrease in the number of bridges funded under the SBRP, reflects this shift. These bridges are included now under the HBRRP.

Most States also use apportioned HBRRP funds to inventory, inspect, and evaluate bridges as required by the NBIS. Of the $178.3 million obligated for this purpose since the beginning of the HBRRP in 1979, 35 States obligated $82.7 million on the Federal-aid system and 37 States obligated $81.6 million for off-system bridges. In addition, three States have obligated $.5 million to inventory bridges for historic significance as authorized in the 1978 STAA. Some States use non-HBRRP funds for these reviews.

A review of program data reveals that the full effect of the 1982 STAA's increased bridge funding has not yet been realized. In 1983, the number of HBRRP construction projects increased significantly (5,245 compared with 2,816 in 1982). To a large extent, though, the preliminary engineering for these projects had been completed in previous years with both HBRRP and other funds and were "on the shelf" waiting for funds to become available for construction. The number of projects under design increased in 1984 (6,589 compared with 4,608 in 1983). The 4,608 projects in 1983 was also an increase over the 3,067 in 1982. However, the number of projects under construction in 1984 dropped below the number in 1983 (4,693 compared with 5,245 in 1983). New construction projects should show a significant increase in 1985 and 1986 as preliminary engineering is completed and projects become ready for construction.

In addition to the $6.4 billion of HBRRP funds obligated in FY's 1979 through 1984 ($1.75 billion in 1984) and the $261.5 million obligated in the first quarter of FY 1985, the States spent $2.8 billion of other Federal-aid funds for bridge improvements during the same period. This $2.8 billion includes funds only for bridge work, not related items such as approaches, utility relocation, right-of-way costs, or funds for new bridges on new roadway alignments. The States spent an additional $6 billion of Federal funds for new bridges on highways during this same 6-year period.

The $2.8 billion in non-HBRRP federal-aid obligations is distributed among the Federal-aid systems as follows:

OTHER FEDERAL-AID FUNDS OBLIGATED FOR BRIDGE REPLACEMENT AND REHABILITATION
(in Millions)

Fiscal Year

System	1979	1980	1981	1982	1983	1984	1st quarter 1985	Total
Interstate	$150	$116	$198	$352	$241	$524	$ 87	$1,648
Primary	44	158	103	115	139	92	17	668
Secondary	12	14	16	56	40	32	9	159
Urban	36	35	24	51	97	98	3	344
Total	$222	$323	$341	$574	$517	$746	$116	$2,819

Section 115 - Construction in Advance of Apportionment and Section 145 - Temporary Matching Fund Waiver

These sections of the 1982 STAA allow the States to advance construction of bridge projects in order to meet their bridge needs as quickly as possible even if sufficient Federal funds are not available. If a State uses all its apportioned HBRRP funds, Section 115 allows it to advance bridge projects with State or local funds. The normal Federal share will be repaid to the State out of later HBRRP apportionments. None of the States has used Section 115 for HBRRP projects.

For FY 1983 and FY 1984, if a State certified that it did not have enough funds to match HBRRP funds, the FHWA could increase the Federal share to 100 percent under Section 145. The amount which each State could waive in this way was limited to the difference between the State's obligation ceilings for FY's 1982 and 1983 plus the amount of minimum allocation funds, if any, a State received in FY 1983 under 23 U.S.C. 157. The State was required to pay back the matching funds on or before September 30, 1984, or the amount would be deducted from its apportionments for the next 7 years.

Ten States obligated a total of approximately $30.2 million of Federal funds in lieu of State matching funds for HBRRP projects under the Temporary Matching Fund Waiver. About $5 million in five States remained outstanding in January 1985. This option is no longer available for advancing projects.

Section 132 - Federal Share of Bridge Projects

Section 132 of the 1982 STAA involves deficient bridge replacement or rehabilitation projects in Tennessee which the State carries out with its own or local funds. If all bridge deficiencies are corrected by the replacement or rehabilitation project, the State receives a credit, equal to 80 percent of the cost, which it may apply to the State share of other eligible HBRRP projects.

A review indicates this provision has had a positive effect on the progress of the off-system bridge program in Tennessee. From the beginning of the program in mid-1982 through 1984, over 1,200 bridges were completed or placed under construction using this procedure (700 in 1984 alone). The program has been used primarily to replace small local bridges which were closed or posted with less than H10 (10 tons) load capacity on roads with an average daily traffic of 750 vehicles or less.

Rehabilitation

The 1978 STAA expansion of the bridge program to permit rehabilitation gave the States and local governments greater flexibility in deciding how to correct deficiencies. Bridge rehabilitation projects are increasing in number. For FY 1983, the FHWA reported that the States used nearly 16.7 percent of the obligated HBRRP funds on rehabilitation projects. The percentage increased to 17.0 percent for FY 1984. Rehabilitation, which analysis often shows to be cost effective, can extend bridge service life if undertaken before deterioration reaches an advanced stage. By accomplishing rehabilitation early, the State can avoid more costly replacement and the bridge can provide reliable service for an indefinite period. In developing HBRRP projects, the States must include cost-effective rehabilitation as an alternative to ensure efficient use of the available resources. The next table shows the amount of HBRRP funds obligated for rehabilitation and the number of bridges, based on 18,246 bridges selected for replacement or rehabilitation and $6,659.6 million obligated since the beginning of the HBRRP:

HBRRP OBLIGATIONS FOR REHABILITATION
FY 1979 Through First Quarter FY 1985

System	No. of Bridges	% of Bridges Selected	Obligated* Funds (Million)	% of Funds Obligated
Interstate	123	0.7	$ 53.8	0.8
Primary	866	4.7	638.2	9.6
Secondary	315	1.7	79.7	1.2
Urban	243	1.3	256.9	3.8
Total Fed.-aid	1,547	8.4	$1,028.6	15.4
Off-system	251	1.4	105.3	1.6
Total	1,798	9.8	$1,133.9	17.0

* Including discretionary bridge funds.

Because rehabilitation has been performed on relatively large bridges, the average cost of rehabilitation is greater than the average cost of replacement. However, in most cases, rehabilitation costs far less than replacement and is a very cost-effective procedure for larger bridges.

Aside from the HBRRP, rehabilitation is an important part of the total federally funded bridge program. Of non-HBRRP Federal funds obligated for bridge projects, the States used over 50 percent for rehabilitation. The following table shows non-HBRRP Federal-aid funds obligated for rehabilitation.

OTHER FEDERAL-AID FUNDS OBLIGATED FOR REHABILITATION
(In Millions)

	Fiscal Year							
System	1979	1980	1981	1982	1983	1984	1st quarter 1985	Total
Interstate	$102	$114	$147	$152	$126	$262	$ 57	$ 960
Primary	36	50	29	45	50	29	10	249
Secondary	3	5	5	7	6	7	2	35
Urban	28	26	19	27	38	45	1	184
Total	$169	$195	$200	$231	$220	$343	$ 70	$1,428

Often, routine preventive maintenance can add many years to a bridge's useful life. In the case of older bridges, though, this extended life can be a problem because many of these structures were designed for the loads at the time of construction, not today's heavier loads. The States must evaluate these bridges, and those with less than desirable widths, so they can compete for funding along with structurally deficient bridges.

Off-System Funds

As noted previously, the States must use no less than 15 percent, nor more than 35 percent, of the apportioned HBRRP funds on off-system bridges. From FY 1979 through FY 1984, the States obligated a total of $1,038.2 million (18.9 percent of the total apportioned funds) for off-system bridges, including $215.9 million in 1984. The States obligated an additional $61.1 million in the first quarter of FY 1985, which brought total obligations for off-system bridges from the beginning of FY 1979 through the first quarter of FY 1985 to $1,099.3 million. This total includes $301.8 million of the $711.5 million the States obligated from the 20 percent of apportionments which can be used on or off the Federal-aid systems. The States used the remaining $409.7 million of the 20-percent funds for Federal-aid system bridges.

Training

The FHWA has prepared and distributed training material to aid in the inventory and inspection of off-system bridges. The material available and under development includes:

1. A series of video tapes showing, in detail, the procedures for inspecting and coding some basic types of bridges. Although the tapes are designed primarily for local governments, they will be made available to all public agencies.

2. A free package of bridge inspection material and instructions to help in the inventory, inspection, and coding of bridges is available to local governments upon request.

3. The FHWA developed a training course package entitled "Practical Highway Bridge Inspection for Local Jurisdiction Inspectors." The training package provides basic bridge inspection training for local government individuals who inspect off-system bridges. As of January 1985, 24 of the 30 sessions of the course provided for in the contract had been presented nationwide.

4. A training course package entitled "Workshop on Rehabilitation of Existing Bridges" has been developed under the Rural Technical Assistance Program. The proposed training package is aimed primarily at short-span bridges on local roads and focuses on methods to extend service life without full scale replacement. Two pilot training sessions were presented during the summer of 1984. Additional workshops are being presented in each FHWA region during 1985.

5. As a result of the June 28, 1983, collapse of the I-95 Mianus River Bridge in Connecticut, the FHWA prepared a video tape demonstrating inspection procedures for pin and hanger suspended span girder bridges. This video tape is available to all States through the National Highway Institute, Federal Highway Administration, Washington, D.C. 20590.

6. Contracts are underway to develop two supplements to the Bridge Inspector's Training Manual, including a short training course. The two supplements are: a) Inspection of Fracture Critical Bridge Members and b) Culvert Failure Analysis/Bridge Inspector's Training Manual Supplement. Both courses and manuals are scheduled for completion in 1985.

Acceleration of Bridge Projects

Although not included directly in the HBRRP, the Acceleration of Bridge Projects is funded under the bridge program. Section 147 of the 1978 STAA directs the Secretary to complete two projects on the Federal-aid system which traverse major bodies of water. The purpose is to demonstrate the feasibility of reducing the time needed to replace unsafe bridges. In accordance with congressional direction, the FHWA selected the U.S. Grant Bridge over the Ohio River between Portsmouth, Ohio, and South Shore, Kentucky, and the East Huntington Bridge over the Ohio River at Huntington, West Virginia.

Construction of the bridge portion of the U.S. Grant (Portsmouth) Bridge is underway. Construction of the approaches in both Kentucky and Ohio is expected to begin in 1985.

For the East Huntington Bridge, the State has completed the approach structures and the main span is nearly completed. Design of steel and concrete alternates is underway for the extension to connect the project to U.S. 60.

The FHWA will prepare a final report on these projects after they are completed.

Historic Bridges

As noted earlier, the States may now use HBRRP funds to inventory their bridges for historic significance. This inventory is an important step in the preservation of historic bridges. By identifying bridges of greatest historic significance which are also suitable for rehabilitation, the inventory should reduce the number and length of delays on projects involving historic and potentially historic bridges. Approximately 80 percent of the States, including the

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District of Columbia and Puerto Rico, have reported data on the historic significance of bridges in their NBI submittals.

Related Bridge Activities

The Center for Auto Safety filed suit in U.S. District Court against the Secretary of Transportation and the Federal Highway Administrator to suspend FHWA approval of all HBRRP projects in any State which has not fully complied with the NBIS or is not adequately maintaining bridges. On November 30, 1984, the U.S. District Court in Washington, D.C., dismissed the suit.

The DOT and FHWA will continue to give top priority to the safety of the Nation's bridges. The FHWA assists State and local governments in assuring that bridges are safe and that provisions of the NBIS are followed.

The June 1983 collapse of the Mianus River Bridge in Connecticut, which resulted in three fatalities, again focused public awareness on the condition of the Nation's bridges. Because of the Nation's very good ongoing national inspection program, bridge collapses such as this are rare. However, the FHWA immediately directed all highway agencies to reinspect all bridges with details similar to the Mianus River Bridge. The States responded promptly by inspecting bridges with similar details to ensure that the problem did not exist elsewhere.

The National Transportation Safety Board (NTSB) investigated the collapse and issued a final report, including specific recommendations, in July 1984. The FHWA response to the report was forwarded to the NTSB in November 1984. Basically, the FHWA accepts the majority of the recommendations and has already placed many of them in operation.

PART II

BRIDGE PROGRAM REVIEW

Introduction

As stated earlier, the FHWA began a management review of the entire Federal bridge program in 1984. The increased HBRRP funding and other changes which the 1982 STAA made in the Federal-aid highway program, including additional funding for Interstate 4R needs (resurfacing, restoring, rehabilitating, and reconstructing), emphasized the importance of reevaluating the total ongoing bridge program. This review has been completed.

Background

In recent years, a number of changes have focused renewed attention on the effectiveness of the FHWA's bridge program. For example, following passage of the 1982 STAA, annual Federal-aid expenditures for all bridge projects increased to over $3 billion, approximately 25 percent of the FHWA's budget. Congress, the media, and special interest groups have expressed concern about the quality, timeliness, and degree of uniformity of bridge inspections as well as about proper load posting. Also, they have expressed concern about the effect the program is having, or should be having, on bridge safety.

In view of these concerns, the FHWA initiated a management review to analyze and evaluate the administration of the bridge program. Under present legislation, the program does not have a defined, long-term objective. Therefore, for the purpose of this management review, we adopted a guiding objective: to improve the Nation's Federal-aid and off-system bridges to the point that, in the future,

they will require only routine maintenance or rehabilitation, thereby reducing the annual cost to the public for bridges in safe operating condition to a minimal level. With this idealistic goal in mind, the management review produced results which could provide a basis for improving the program, a means of assessing how the State highway agencies are managing their bridge programs, and a focus for greater FHWA and State management attention to program activities.

Objectives

To evaluate the administration of the bridge program, the FHWA established the following objectives:

1. To determine whether the funds currently available under the bridge program are being used in an efficient and cost-effective manner.

2. To evaluate how uniformly the requirements of the bridge program are being applied nationwide.

3. To determine to what degree the States are complying with the NBIS.

4. To develop a foundation for the development and implementation of improved bridge program management techniques.

Approach

The first step in this review was to collect information on how the bridge program is administered nationwide. Data collection instruments included questionnaires and interview discussion topics and were designed to make computer input and analysis of the responses easier.

The FHWA Bridge Division distributed questionnaires to all FHWA division offices. Further, a review team conducted site visits to nine divisions, one in each region as selected by the FHWA Regional Administrators. The review team consisted of one or more senior executives from the Office of Engineering, representatives from the FHWA Bridge Division, and the Regional Administrator of the region involved or his Deputy. Site visits were scheduled in conjunction with NBIS reviews.

The data collected from the questionnaires and site visits were compiled and analyzed.

COMPLIANCE WITH NATIONAL BRIDGE INSPECTION STANDARDS

One objective of the management review was to determine the degree of State compliance with the NBIS. The items of discussion were: (1) the NBIS requirements and two major issues relating to those requirements -- inspection and load posting; and (2) the quality of NBI data.

Inspection and Load Posting

The NBIS requires inspection of all public bridges to determine their adequacy to carry vehicular traffic safely. The three most critical parts of the standards involve the extent of inspections, load posting, and qualifications of the personnel inspecting the bridges. Of considerable importance also are guidelines for conducting the inspections. Following are discussions of each of these elements:

1. Extent of Inspections. Two factors affecting the extent of inspections are depth and frequency.

a. Depth. The depth of an inspection involves the degree of detail involved. Relatively new bridges, for example, may not require intensive inspection while an older structure may need to be inspected in considerable detail. The extent of the inspection is determined by such factors as structure type, age, traffic characteristics, state of maintenance, and known deficiencies. The individual in charge of the inspection program is responsible for determining the depth of the inspections to be conducted. Most States do not have written procedures for adjusting the depth of inspection to the condition of the bridge.

b. Frequency. The NBIS requires that each bridge on public roads be inspected at regular intervals, not to exceed 2 years. According to current NBI data, a significant number of Federal-aid system and off-system bridge inspection dates are more than 3 years old.

2. Load Posting. One requirement of the NBIS is that each bridge that is inspected shall be rated as to its safe load carrying capacity. If the maximum legal load under State law exceeds the operating rating (the absolute permissible load to which the structure should be subjected), the bridge must be posted in conformance with the AASHTO Manual (see page 32) or State law.

Since publication of the NBIS, the FHWA has promoted the benefits of bridge inspection and load posting and encouraged the States to comply. For the most part, this effort has been successful on the Federal-aid highway systems, nearly all elements of which are operated and maintained by the State highway agencies.

The inclusion in 1979 of all highway bridges on public roads added greatly to the workload of the States, and created difficulties related to load posting. Further, many bridges on public roads are under the jurisdiction of county or local governments. As a result, the responsibility for posting or closing a large portion of off-system bridges rests solely with local government officials.

While the Federal interest in local or off-system bridges is less than our interest in Interstate or primary system bridges, the NBIS applies to all highway bridges on public roads, and bridge inspection and load posting are matters of public safety. A significant number of bridges, predominantly off the Federal-aid system, which should be load restricted are not coded by the States as being load posted (see Tables 5A and 5B).

In the past, FHWA has attempted to work positively with State highway agencies to offer advice and assistance and to promote statewide compliance with the NBIS. For example, FHWA decided administratively that HBRRP funds could participate in the initial purchase and placement of load posting signs. This was done to help poorer counties which could not afford signs. (Signs and installation cost about $750 per bridge.) While some local governments have taken advantage of this decision, the problem of noncompliance continues.

3. Qualifications of Personnel. The NBIS lists the qualifications for personnel involved in bridge inspections. The individual in charge of the program in each State meets the NBIS qualification requirements.

a. Team Leaders. Bridge inspection team leaders are required to meet the minimum qualifications in the NBIS. Nationwide, 97 percent of the team leaders meet this requirement.

b. Inspectors. The NBIS does not contain any minimum qualifications for bridge inspection team members other then team leaders. However, FHWA has been active in developing training materials and a certification program for inspectors.

1) Training. The NBIS qualifications for a bridge inspection program chief or a bridge inspection team leader specify in part that any incumbent who is not a registered professional engineer or qualified for registration must have completed a comprehensive training course based on the "Bridge Inspector's Training Manual."

The course is not intended to provide participants only with facts, but rather to enable them to evaluate the conditions observed on bridges against both subjective and objective rating criteria. Personnel who successfully complete a comprehensive course should be able to evaluate whether bridges are safe for public travel.

In the early 1970's, the National Highway Institute (NHI) developed a 3-week comprehensive course on bridge inspection. The course material is available from Washington Headquarters and most regions have their own copies.

We do not require refresher courses after the initial comprehensive course. However, most States periodically offer refresher training courses for bridge inspectors.

To aid in the inventory and inspection of off-system bridges, the FHWA has prepared and distributed, or has under development, other training materials. Some examples are listed on pages 21 and 22.

The training programs being developed, along with those already underway, are intended to provide some of the assistance which all levels of government need to continue the bridge inspection program.

2) Inspector Certification. One method of ensuring greater compliance with the NBIS requirements for inspectors would be to include bridge inspector certification. For example, the National Society of Professional Engineers sponsors a certification program through the National Institute for Certification of Engineering Technologies (NICET). Under this program, technicians can take tests which, combined with their work experience, will establish their competence in various work categories associated with the role of technicians in government. To date, NICET programs have been established for a number of highway-related disciplines.

The FHWA is working with the NICET to establish a certification program for bridge inspectors. By the end of 1985, an NICET

certification process for levels I through IV bridge inspectors should be available. This process will provide a means for inspectors to be certified nationally as competent in bridge inspection.

4. AASHTO Manual for Maintenance Inspection of Bridges. This manual sets out the guidelines for conducting bridge inspections to meet the requirements of the NBIS. While this manual offers general instructions for bridge inspections, it does not provide details on inspecting some bridge types.

The AASHTO Manual was intended to be general in nature, not oriented to specifics, in order to provide some discretion for the bridge owner and rating agency. However, since portions of the inspection and evaluations are subjective, there has been some variation in inspections. In interviews, some officials suggested that explicit instructions and examples should be provided for the more critical portions of a bridge, not only for uniformity, but also for thoroughness.

Conclusions. As a result of the data analyzed during this review, we do not believe compliance with the NBIS has been adequate. Some bridges are not being inspected at the required frequency, some bridges that should be load posted are not, there are nationwide variations in the depth of inspections, and in a few cases, inspection team leaders are not fully qualified. The FHWA will be taking new, strong, positive actions in the coming year to achieve uniform compliance with the NBIS.

BRIDGE PROGRAM MANAGEMENT

As currently structured, two issues are of prime importance to a successful bridge program. The program must have clear cut national goals and the States must be actively involved in management of their own programs. These two issues are discussed below.

1. National Bridge Program Goals. In its current form, the Federal-aid highway bridge program has no clearly defined realistic short- or long-term goals. Theoretically, the goal is to eventually do away with the HBRRP and turn the funds back into the categorical programs and, through efficient long-term program management, to minimize the amount of categorical Federal-aid funds needed to replace or rehabilitate bridges. However, the total bridge needs are too great at this point to achieve this goal in the foreseeable future. For example:

   - Each year, the Secretary's Annual Report to Congress on the HBRRP estimates the cost of bringing all existing deficient highway bridges up to standard. The current estimate has again increased.

   - The current listing of deficient bridges that are eligible for replacement or rehabilitation now includes 236,000 bridges -- 41 percent of the Nation's 574,100 inventoried highway bridges.

   - In 1983 and 1984, the States began more than 7,000 projects each year to replace or rehabilitate bridges or to build bridges at new locations. By comparison, the States began 4,000 bridge projects in 1982.

The Secretary's Annual Reports over the last 5 years have generally shown increases in the number of bridges eligible for replacement or rehabilitation and the estimate of cost to bring all existing deficient highway bridges up to standard. In this report, the number of Interstate, primary and urban system bridges eligible for replacement has again increased as the ongoing bridge inspection program continues to identify and classify additional deficient bridges. The greater number of deficient bridges, coupled with the increased replacement costs reported by the States this past year, have raised the overall estimate to replace or rehabilitate all deficient bridges. However, as noted in Part I, this increased cost does not reflect a realistic picture of bridges which must be improved, because not all bridges on the list of eligible structures will ever be rehabilitated or replaced. It is not economically feasible or practical to improve all 236,000 bridges classified as deficient, nor is it necessary to do so from a safety standpoint.

In general, the 236,000-bridge candidate selection list is too long. In particular, the large number of bridges rated deficient only because of geometric deficiencies while at the same time having sufficiency ratings above 50 (51,000 bridges) suggests that many may be good candidates for cost-effective traffic control devices rather than bridge rehabilitation. They certainly are not dangerous from a structural viewpoint.

The 104,700 eligible functionally obsolete bridges include 10,200 bridges which are in good to excellent condition but were designed for loads much less than those currently wanting to use them. The total also includes about 1,500 bridges with inadequate waterways. Another 26,000

have multiple deficiencies. These 37,700 bridges will, in most cases, be considered a higher priority than the 67,000 remaining that are deficient solely because of geometric deficiencies.

A change in the eligibility criteria could direct the bulk of program funds towards improvement of bridges with structural inadequacies. At the same time, an ideal redirection of HBRRP funds would be to limit the number of bridge projects selected on low-volume roads with only geometric deficiencies.

Further, the recent knowledge and experience that the FHWA and the States are gaining in innovative and proven bridge rehabilitation techniques suggests that replacement eligibility criteria should be tightened to ensure more rehabilitation projects. This change would result in a much more cost-effective use of HBRRP funds. More bridges could be improved at a faster rate if this redirection were accomplished.

One option under consideration is reducing the replacement and rehabilitation eligibility of deficient bridges to a sufficiency rating less than 45 and less than or equal to 60, respectively. This eligibility change would remove 60,000 bridges from the candidate selection list and reduce the needs estimate by $14.2 billion, including $.4 billion for the Interstate System. The change would affect only those bridges with the lowest priority for improvement. Since the current sufficiency rating criteria is an administrative threshold, changes in the rating criteria can be made administratively without changes in regulations or Title 23.

Another pertinent consideration is the proper role of the Federal Government. While the Federal role in ensuring the safety of Interstate and primary system bridges is clear, the Federal role in bridge programs for the other systems is not. Certainly some bridges (those on very low-volume, remote rural roads, for example) are more logically the responsibility of State or local governments, which, in many cases, already have separate, non-Federal bridge programs.

The two key steps in setting national goals for the bridge program are identifying priority needs and establishing what the Federal role should be in meeting them. This second point is especially important: to what degree should the Federal Government continue to be involved in meeting priority off-system bridge needs.

a. Identification of Priority Needs. As discussed before, the Nation cannot reasonably expect to improve 236,000 bridges eligible for rehabilitation or replacement by current definition.

   One of the main objectives of the HBRRP is to remove from service those highway bridges most in danger of failure. While Federal funds are being spent on bridges at the rate of about $3 billion a year, they are not necessarily always being used on the worst bridges. With such a large list of eligible candidates to choose from, the Federal Government has difficulty ensuring that the worse bridges get proper attention.

Some officials have suggested that other criteria be included with the sufficiency rating for identifying priority needs. These criteria, for example, could provide variable factors for establishing the load capacity or geometric functions that are essential for bridges on the various highway systems. The FHWA has encouraged the States to develop bridge ranking and project selection procedures (see page 11). However, more definitive criteria have never been established on a national basis.

Another suggestion is to find a way to establish bridge priorities by function or class, thereby focusing attention on those bridges most in need of attention.

b. The Federal Role. When the Special Bridge Replacement Program began, only bridges on the Federal-aid system were eligible. Therefore, Federal attention was focused on Federal-aid system bridges.

When the 1978 STAA expanded the program to include off-system bridges, the change greatly increased the number of bridges under Federal oversight. As of December 31, 1984, bridges on the Federal-aid systems accounted for 47 percent of the 574,100 bridges in the NBI. However, Federal-aid system bridges accounted for only 27 percent of all bridges rated deficient in the NBI.

With the large number of bridges requiring attention, emphasis should be placed on ensuring that the most deficient bridges are receiving proper consideration.

2. Bridge Management Programs at State Level. None of the States has a current and comprehensive bridge management program, although a few are trying to develop bridge management systems.

Questionnaire results indicated that 46 percent of the States have or are developing formal procedures for the distribution of HBRRP funds. None of the others has a formal distribution procedure. Only two States have separate funding programs for replacing or rehabilitating deficient major or complex bridges. Approximately 40 percent of the States have master plans for rehabilitating or replacing on-system bridges, and 37 percent have similar master plans for off-system bridges. Only 50 percent of the States have or are developing written procedures for determining priorities in selecting bridge projects.

Each State has a system for collecting inventory and inspection data, including information on the condition of the bridges, which is the core of a State's bridge management program. With this information, a State can establish priorities in order to select those bridges most in need of rehabilitation or replacement. As the program becomes more sophisticated, the State can progress from merely establishing bridge project priorities to predicting where and when bridge work will be needed based on traffic load projections and other data. With the capability to establish priorities and anticipate bridge workload, a State can more effectively plan and budget for its bridge program. The FHWA is planning a demonstration project on bridge priority selection systems to assist the States in implementing management systems for prioritizing bridge projects so as to make optimum use of bridge funds.

Conclusions. The current list of bridges eligible for rehabilitation or replacement is large. To reduce the list to a manageable size and to ensure that the most deficient bridges are taken care of, several things must happen.

First, national bridge program goals must be set, including a definition of priority needs. Federal, State, and local governments' respective interests in the highway network vary considerably. The Federal interest, of course, lies principally with the Interstate and primary system for movement of goods and people throughout the Nation. Any future legislative proposals from the DOT would tend to emphasize this point. States are normally concerned with arterials and some major collectors. The interest of local governments is focused on the collector routes and local roads and streets. The same areas of interest pertain to bridges also. Therefore, at the Federal level, more concern should be concentrated on the Interstate and primary systems.

Second, the Federal role should include overall guidance for the bridge program on the Federal-aid system and ensure that the States have a suitable bridge program for other systems. This guidance would include standards for inspection, inventory, etc.

Third, each State must become more systematic in managing its own State programs. Under present conditions, State project selection procedures are not designed, in many cases, to fund priority bridge needs.

OTHER REVIEW FINDINGS

1. Efficient and Cost-Effective Use of Bridge Funds. Rehabilitation is an important part of the total federally-funded bridge program. Over 50 percent of non-HBRRP Federal funds used for bridge projects are used

for rehabilitation. This trend toward more rehabilitation projects suggests that the States are making progress in using their federal-aid funds efficiently and cost effectively.

2. Uniform Application of Requirements Nationwide. As discussed in previous sections of this report, some requirements of the HBRRP do not appear to be applied uniformly across the country. For example, Title 23, U.S. Code, Section 144, requires that HBRRP funds ". . . shall be made available . . . throughout each State on a fair and equitable basis." Only 21 States have formal procedures for the distribution of HBRRP funds. Some States operate on a "first come, first served" basis.

   Another requirement of the HBRRP is that consideration be given to projects which will remove from service highway bridges most in danger of failure. Questionnaire results indicated that 40 percent of the States had master plans for rehabilitating or replacing all deficient on-system bridges; 37 percent had master plans for off-system bridges. Without a master plan, it might be difficult to ensure that the most dangerous bridges will be repaired or replaced.

   A few local governments fail to apply the requirements of the NBIS, for example, not posting bridges which should be posted. This noncompliance is more a case of not applying the standards at all than nonuniformity of application.

3. Bridge Geometry

   Geometric Criteria. Recently, AASHTO published its revised manual, "A Policy on Geometric Design of Highways and Streets, 1984." This manual includes minimum standards for new and reconstructed bridges, and for

bridges to remain in place at average daily traffic volumes as low as 0 - 50. These standards represent the minimum acceptable standards which will adequately serve the public over the life of the projects. These revised standards are still greater than some local governments believe necessary. At the same time, they are less than some safety advocates desire.

Generally, spending public funds on projects which leave in place or build substandard bridges is a poor investment, but there are some cases where applying even the minimum standards may not be appropriate. For example, in remote regions with very low average daily traffic, the AASHTO minimum standards may be more than are necessary for an adequate bridge. When this is the case, the State is responsible for justifying and requesting an exception from the applicable AASHTO standards for Federal-aid bridge projects. For most situations, the FHWA Division Office in the State has approval/disapproval authority for exception requests.

Those existing bridges for which FHWA has approved an exception to the AASHTO standards are now being reclassified in the bridge inventory as nondeficient because they are considered adequate for the type and volume of projected traffic over their remaining life. The same holds true for new bridges which were granted an exception prior to construction.

Summary

The bridge management review identified some areas where revisions would benefit the overall bridge program. During the next year, the FHWA will be making administrative changes and the Administration will be working with the Congress to implement legislative changes for program improvements.

TABLE 1A

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 65% ON-SYSTEM - 118

AS OF DECEMBER 31, 1984

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 85	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	87,993,671.00	6,235,000.73	72,311,167.73	15,279,303.27
ALASKA	11,992,891.00	2C*,531,45CR	6,577,795.36	5,415,095.64
ARIZONA	11,992,891.00		7,223,146.32	4,769,744.68
ARKANSAS	88,179,397.00	7,183,714.00	66,218,453.00	21,960,944.00
CALIFORNIA	126,160,375.00	9,734,949.19	91,679,361.58	34,481,013.42
COLORADO	43,097,317.00	3,677,741.32	32,028,250.91	8,069,066.09
CONNECTICUT	60,785,040.00	2,342,308.98	42,225,929.59	18,559,110.41
DELAWARE	11,992,891.00	109,860.00	6,946,160.49	5,046,730.51
FLORIDA	116,903,292.00	7,597,923.00	109,977,820.00	8,925,471.00
GEORGIA	107,884,215.00	2,613,872.87	90,803,179.10	17,081,035.90
HAWAII	14,366,992.00		11,700,896.00	2,666,046.00
IDAHO	21,947,650.00	817,260.00	19,482,554.70	2,465,095.30
ILLINOIS	260,423,148.00	7,927,052.20	235,770,210.20	24,652,937.80
INDIANA	91,912,881.00	8,626,561.32	74,283,385.19	17,629,495.81
IOWA	123,466,313.00	2,059,611.41	91,258,500.63	29,189,812.37
KANSAS	130,362,761.00	4,331,495.70	85,323,107.97	40,039,653.03
KENTUCKY	130,860,978.00	6,002,524.47	121,636,867.85	9,164,110.15
LOUISIANA	141,636,392.00	6,948,463.28	123,523,287.28	18,463,304.72
MAINE	28,005,252.00	785,877.99	22,312,572.92	5,692,679.08
MARYLAND	88,317,913.00	412,619.00CR	64,467,661.00	23,850,252.00
MASSACHUSETTS	133,223,965.00	2,823,840.80	62,716,379.28	40,487,585.72
MICHIGAN	66,476,414.00	935,005.18	50,653,869.63	16,222,604.37
MINNESOTA	114,134,195.00	785,591.43	99,729,285.51	14,404,912.49
MISSISSIPPI	85,326,542.00	5,865,990.00	60,930,482.00	24,376,060.00
MISSOURI	162,699,200.00	11,122,597.56	125,962,173.93	36,193,030.07
MONTANA	32,389,527.00	1,655,189.41	16,883,549.15	15,504,977.85
NEBRASKA	82,110,079.00	3,149,059.00	67,288,855.34	14,821,223.66
NEVADA	11,992,891.00	51,200.00	6,103,342.00	5,892,549.00
NEW HAMPSHIRE	18,896,883.00	965,955.52	28,693,109.39	10,393,376.61
NEW JERSEY	168,111,612.00	1,613,583.35	93,157,381.47	74,954,230.53
NEW MEXICO	17,830,152.00	516,611.68	14,558,109.68	3,272,042.32
NEW YORK	439,208,272.00	19,333,602.00	360,423,582.00	78,784,710.00
NORTH CAROLINA	148,706,674.00	1,476,706.00CR	94,206,551.00	54,499,923.00
NORTH DAKOTA	27,561,479.00	672,720.35	23,124,589.35	4,436,889.65
OHIO	130,749,891.00	6,527,114.00	103,186,543.00	27,163,348.00
OKLAHOMA	76,886,969.00	2,585,451.06	47,949,083.10	28,937,885.90
OREGON	68,837,131.00	6,053,563.81	30,799,613.16	18,081,517.84
PENNSYLVANIA	287,267,874.00	23,370,788.35	207,656,423.35	39,611,450.65
RHODE ISLAND	17,990,692.00	2C,129,37CR	13,273,841.58	4,319,640.42
SOUTH CAROLINA	96,990,726.00	1,227,337.40	32,298,174.64	24,711,931.36
SOUTH DAKOTA	23,839,437.92	297,666.00	15,547,414.98	8,292,022.94
TENNESSEE	166,197,907.00	16,518,621.00	147,261,757.00	18,936,149.00
TEXAS	203,532,312.00	898,862.00CR	124,612,183.00	78,920,129.00
UTAH	11,992,891.00	538,636.47	9,412,994.07	2,579,896.93
VERMONT	36,678,999.00	65,333.38	19,696,9CP.01	16,982,090.99
VIRGINIA	116,753,008.00	576,295.85	101,854,725.66	14,898,282.34
WASHINGTON	109,912,079.00	598,785.45	91,531,853.70	18,380,221.30
WEST VIRGINIA	86,934,572.00	114,606.00CR	46,350,478.00	40,584,094.00
WISCONSIN	108,621,482.00	3,036,833.37	74,452,C31.05	34,169,450.95
WYOMING	11,992,891.00	841,248.00	9,213,785.00	2,779,106.00
DIST. OF COL.	42,743,541.00	437,178.29	17,838,887.70	24,904,653.30
PUERTO RICO	13,502,101.00	182,999.05	8,116,126.66	5,385,974.34
TOTAL	4,794,986,384.92	185,955,089.11	3,670,764,085.11	1,124,122,299.81

TABLE 1B

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 15% OFF-SYSTEM - 117

AS OF DECEMBER 31, 1984

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 85	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	20,213,196.00	329,800.67	15,673,966.67	4,539,239.33
ALASKA	2,767,589.00	85,788.05	1,521,796.68	1,245,792.32
ARIZONA	2,767,589.00	4,918.00	2,206,440.00	561,149.00
ARKANSAS	20,349,691.30	2,216,632.00	18,040,576.00	2,308,615.00
CALIFORNIA	29,113,931.00	560,630.16	22,949,865.35	6,264,065.65
COLORADO	9,253,227.00	299,614.00	6,133,425.97	3,119,801.03
CONNECTICUT	14,027,317.00	1,042,282.27	5,728,967.78	8,298,349.22
DELAWARE	2,767,589.00	96,080.00	1,272,078.97	1,495,510.03
FLORIDA	27,439,222.00	108,398.00	23,452,654.00	3,986,568.00
GEORGIA	24,896,356.30	1,313,227.31	20,866,366.31	4,030,005.69
HAWAII	3,210,832.00	78,664.00	1,650,048.42	1,560,783.58
IDAHO	5,084,843.00		3,977,036.01	1,087,806.99
ILLINOIS	60,097,649.00	4,969,110.00	57,544,300.00	2,553,349.00
INDIANA	21,210,686.30	435,468.85	14,496,911.12	6,713,744.88
IOWA	27,794,845.00	4,839,963.23	27,058,747.22	736,092.78
KANSAS	31,006,788.00	304,731.68	24,705,169.71	6,301,618.29
KENTUCKY	30,184,842.00	832,309.35	27,331,279.42	2,853,562.58
LOUISIANA	44,304,593.00	714,995.17	38,929,354.22	5,374,798.78
MAINE	6,462,750.00	508,777.57	4,664,376.08	1,798,373.92
MARYLAND	20,381,059.00	161,429.00	13,018,090.00	7,362,985.00
MASSACHUSETTS	23,816,299.00	969,541.20	8,291,393.39	15,524,905.61
MICHIGAN	15,439,017.00	246,136.20	11,867,189.02	3,565,827.98
MINNESOTA	26,338,660.00	754,152.06	23,573,397.26	2,765,262.74
MISSISSIPPI	19,686,125.00	518,998.00	12,200,859.00	7,485,926.00
MISSOURI	37,397,355.00	2,722,159.78	18,561,463.89	18,835,891.11
MONTANA	7,473,593.00	24,354.34	3,540,157.80	3,933,435.20
NEBRASKA	18,548,685.00	734,960.00	15,584,320.90	3,364,159.10
NEVADA	2,767,589.00	34,872.00	1,406,888.00	1,360,725.00
NEW HAMPSHIRE	8,969,578.00	316,529.38	7,739,249.08	1,229,328.92
NEW JERSEY	36,796,947.00	36,892.98CR	10,071,447.18	26,723,499.82
NEW MEXICO	4,114,651.30	38,348.22	3,280,070.22	834,574.78
NEW YORK	101,355,069.00	8,853,548.00	87,565,929.00	13,789,140.00
NORTH CAROLINA	34,316,878.00	3,004,719.00	30,506,947.00	3,809,931.00
NORTH DAKOTA	6,359,726.00	319,983.23	5,496,568.20	859,157.80
OHIO	30,690,744.00	862,321.03	20,667,419.00	9,623,229.00
OKLAHOMA	17,743,147.00	889,200.00	5,152,895.55	12,590,251.45
OREGON	11,270,106.00	964,771.45	6,263,121.26	5,006,984.74
PENNSYLVANIA	56,282,887.70	1,593,187.63	47,309,788.87	18,986,898.13
RHODE ISLAND	4,089,763.29	2,000.00	3,128,147.17	960,598.12
SOUTH CAROLINA	13,199,548.00	706,280.40	9,059,653.48	4,099,894.52
SOUTH DAKOTA	5,118,989.00	107,792.00	3,826,092.53	1,292,896.47
TENNESSEE	37,891,823.00	2,568,873.00	19,251,698.00	18,640,125.00
TEXAS	66,968,995.00	581,105.70	33,560,652.09	33,408,342.91
UTAH	2,767,589.00	42,199.56	2,227,484.58	540,104.42
VERMONT	8,495,194.00	193,613.63	7,359,119.76	1,136,074.24
VIRGINIA	28,993,001.38	986,191.65	16,687,994.61	12,305,006.77
WASHINGTON	25,341,248.00	642,976.75CR	20,434,116.74	4,907,131.26
WEST VIRGINIA	20,061,824.00	492,312.00	11,734,274.00	8,327,550.00
WISCONSIN	25,066,494.00	1,090,774.03	17,423,563.24	7,642,930.76
WYOMING	2,767,589.00	269,679.00	2,236,271.00	531,318.00
DIST. OF COL.	1,398,970.00	187,637.75	1,504,722.68	1,398,970.00
PUERTO RICO	3,115,869.00			1,811,146.32
TOTAL	1,097,684,282.29	47,969,754.66	799,070,046.19	298,614,236.10

TABLE IC

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 20% ON/OFF-SYSTEM - 114

AS OF DECEMBER 31, 1984

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 85	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	26,053,913.00	3,999,195.29	24,236,632.20	2,714,280.80
ALASKA	3,690,119.00	2,[illegible]	1,810,439.00	1,879,680.00
ARIZONA	3,690,119.00	5,141.59	2,784,334.47	905,784.53
ARKANSAS	27,132,120.00	1,162,691.00	15,989,699.00	11,142,421.00
CALIFORNIA	38,834,473.00	370,969.75	17,545,508.96	21,279,464.04
COLORADO	12,337,634.00	20,870.75	8,644,744.81	3,692,889.19
CONNECTICUT	18,763,088.00		12,271,869.00	6,491,219.00
DELAWARE	3,690,119.00		2,645,176.88	1,044,942.12
FLORIDA	36,685,629.00	2,415,038.00CR	29,098,901.00	7,586,728.00
GEORGIA	33,195,140.00	1,445,397.79	17,391,398.33	15,803,741.67
HAWAII	4,414,443.00	48,030.20	1,028,802.00	3,385,641.00
IDAHO	6,753,122.00	292,000.00	4,316,295.23	2,436,826.77
ILLINOIS	90,130,198.00	527,227.76CR	69,778,358.24	10,351,839.76
INDIANA	28,290,884.00	229,916.00CR	14,034,743.00	14,246,141.00
IOWA	37,459,786.00	56,509.86CR	29,552,759.60	7,907,026.40
KANSAS	41,362,584.00	536,199.38	31,778,771.47	9,583,812.53
KENTUCKY	40,246,451.00	2,701,367.47	38,036,359.80	2,210,091.20
LOUISIANA	59,672,735.00	233,647.20	48,892,133.78	10,780,601.22
MAINE	9,636,996.00	100,[illegible]	5,129,104.43	4,507,891.57
MARYLAND	28,628,664.00	2,171,993.00	16,135,182.00	12,493,482.00
MASSACHUSETTS	31,755,064.00	58,582.80	13,909,747.32	17,845,316.68
MICHIGAN	20,537,154.30	262,720.00	16,295,262.74	4,332,092.26
MINNESOTA	35,119,212.00	2,456,525.38	26,615,262.56	8,502,949.44
MISSISSIPPI	26,268,164.00	366,307.00CR	14,681,519.00	11,666,645.00
MISSOURI	49,863,139.00	1,169,500.00	34,686,681.38	15,377,057.62
MONTANA	9,564,775.00	891,174.32	4,124,953.12	5,839,821.88
NEBRASKA	25,269,638.00	69,000.00	19,568,333.17	5,696,304.83
NEVADA	3,690,119.00		1,306,031.00	2,384,088.00
NEW HAMPSHIRE	11,952,762.00	1,226,498.49	7,122,385.03	4,830,376.97
NEW JERSEY	41,726,594.00	679,876.00CR	18,019,282.40	33,707,311.60
NEW MEXICO	5,486,199.00	18,873.37	2,213,838.38	3,272,360.62
NEW YORK	135,140,054.20	663,185.00CR	104,286,649.00	30,853,405.00
NORTH CAROLINA	45,755,835.00	1,281,810.00CR	33,681,271.00	12,074,564.00
NORTH DAKOTA	8,674,299.00	25,661.62CR	6,876,969.38	1,797,868.62
OHIO	40,167,656.00	243,083.00	17,902,225.00	22,265,431.00
OKLAHOMA	23,657,526.00		9,823,926.24	13,833,599.76
OREGON	15,026,807.00	394,133.41	8,862,547.44	6,164,259.56
PENNSYLVANIA	88,390,111.30	1,047,968.60	69,443,441.87	18,946,669.43
RHODE ISLAND	5,267,365.90		3,227,506.52	2,039,859.38
SOUTH CAROLINA	17,426,661.00	909,192.00	15,539,356.22	2,216,704.78
SOUTH DAKOTA	6,829,314.00	70,[illegible].00	5,265,860.52	1,559,453.48
TENNESSEE	50,522,431.00	5,798,022.00	42,428,990.00	8,093,441.00
TEXAS	62,629,328.00	612,449.00CR	27,585,455.91	35,039,872.09
UTAH	3,690,119.00	4,000.00	2,823,948.85	866,170.15
VERMONT	11,873,538.30	89,827.21	8,490,033.24	3,873,504.76
VIRGINIA	35,924,001.00	444,539.18	31,713,541.68	4,210,459.32
WASHINGTON	33,798,329.00	183,801.66	28,306,369.30	5,491,963.70
WEST VIRGINIA	26,749,098.00	302,760.00CR	14,704,667.00	12,044,691.00
WISCONSIN	33,421,993.00	657,617.84	20,467,564.83	12,954,428.17
WYOMING	3,690,119.00	686,450.00	1,936,777.00	1,753,342.00
DIST. OF COL.	21,626,786.00	209,092.80	10,218,808.42	11,407,977.58
PUERTO RICO	8,519,993.30	69,278.12CR	1,601,540.58	6,918,452.72
TOTAL	1,489,984,927.90	22,662,374.34	1,013,357,808.40	476,627,119.50

TABLE 1D

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT DISCRETIONARY FUNDS - 119

AS OF DECEMBER 31, 1984

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 85	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	49,562,470.00		19,018,470.00	27,944,000.00
ALASKA	20,369,336.00		20,369,309.26	.74
ARIZONA				
ARKANSAS				
CALIFORNIA	74,717,749.00		62,660,749.00	12,057,000.00
COLORADO	51,817,551.00		32,997,551.00	18,820,000.00
CONNECTICUT				
DELAWARE	15,171,082.10		15,171,082.10	
FLORIDA	10,020,000.00		10,020,000.00	
GEORGIA	21,000,000.00		21,000,000.00	
HAWAII				
IDAHO	18,299,943.00		17,773,243.00	526,700.00
ILLINOIS	98,213,925.00	3,510,839.00CR	92,930,086.00	5,280,839.00
INDIANA				
IOWA	47,270,479.00	12,789.89CR	45,189,854.18	2,080,623.82
KANSAS	31,486,857.36		31,486,857.36	
KENTUCKY				
LOUISIANA	9,592,000.00		9,592,000.00	
MAINE	7,240,000.00		7,240,000.00	
MARYLAND	17,433,000.00		17,433,000.00	
MASSACHUSETTS	60,000.00		60,000.00	
MICHIGAN	33,499,120.00		33,499,120.00	
MINNESOTA	12,739,200.00	251,960.00	11,571,160.00	1,168,040.00
MISSISSIPPI	54,655,279.30		32,053,279.00	22,602,000.00
MISSOURI	63,126,803.77	444,836.00CR	58,748,932.49	4,377,911.28
MONTANA	2,736,000.00		2,736,000.00	
NEBRASKA	10,606,722.00		10,606,722.00	
NEVADA				
NEW HAMPSHIRE				
NEW JERSEY	27,699,876.00	819,876.00	27,699,876.00	
NEW MEXICO				
NEW YORK	165,387,000.30		114,494,000.60	50,892,000.00
NORTH CAROLINA	10,403,000.30		8,993,012.00	1,406,988.00
NORTH DAKOTA	12,800,000.00		12,800,000.00	
OHIO	45,385,368.00		34,423,498.00	10,961,870.00
OKLAHOMA				
OREGON	16,920,000.00		16,694,197.00	225,803.00
PENNSYLVANIA	122,060,000.00	772,964.00	95,974,270.00	26,085,730.00
RHODE ISLAND	43,818,000.00		43,818,000.00	
SOUTH CAROLINA	35,985,551.00	6,869,580.00	34,381,899.72	1,603,651.28
SOUTH DAKOTA				
TENNESSEE	37,254,632.00		27,974,632.00	9,280,000.00
TEXAS	8,400,000.00		8,400,000.00	
UTAH				
VERMONT	11,176,000.00		738,000.00	10,438,000.00
VIRGINIA	30,773,000.00		30,773,000.00	
WASHINGTON	73,117,495.30		73,108,669.68	8,825.32
WEST VIRGINIA	42,562,000.00		42,562,000.00	
WISCONSIN	54,607,961.00		54,592,866.68	15,094.32
WYOMING				
DIST. OF COL.	17,860,000.30		1,860,000.00	16,000,000.00
PUERTO RICO				
SUBTOTAL	1,397,531,409.23	9,741,415.11	1,176,368,332.47	221,163,076.76
UNALLOCATED	2,468,590.77			
TOTAL	1,400,000,000.30			

TABLE 1E

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
ACCELERATION OF BRIDGE PROJECTS - 116

AS OF DECEMBER 31, 1984

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 85	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA				
ALASKA				
ARIZONA				
ARKANSAS				
CALIFORNIA				
COLORADO				
CONNECTICUT				
DELAWARE				
FLORIDA				
GEORGIA				
HAWAII				
IDAHO				
ILLINOIS				
INDIANA				
IOWA				
KANSAS				
KENTUCKY	67,878,004.00		67,878,004.00	
LOUISIANA				
MAINE				
MARYLAND				
MASSACHUSETTS				
MICHIGAN				
MINNESOTA				
MISSISSIPPI				
MISSOURI				
MONTANA				
NEBRASKA				
NEVADA				
NEW HAMPSHIRE				
NEW JERSEY				
NEW MEXICO				
NEW YORK				
NORTH CAROLINA				
NORTH DAKOTA				
OHIO				
OKLAHOMA				
OREGON				
PENNSYLVANIA				
RHODE ISLAND				
SOUTH CAROLINA				
SOUTH DAKOTA				
TENNESSEE				
TEXAS				
UTAH				
VERMONT				
VIRGINIA				
WASHINGTON				
WEST VIRGINIA	45,319,119.00	9,496.00	37,636,589.00	7,697,426.00
WISCONSIN				
WYOMING				
DIST. OF COL.				
PUERTO RICO				
SUBTOTAL	113,208,119.30	9,496.00	105,510,993.00	7,697,426.00
UNALLOCATED	86,617,881.00			
TOTAL	199,826,000.30			

TABLE 2A

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
MANDATORY 65 PERCENT ON-SYSTEM - 118
AS OF DECEMBER 31, 1984

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	375	80	59	514
ALASKA	1	1	8	10
ARIZONA	4	0	8	12
ARKANSAS	39	99	53	191
CALIFORNIA	79	51	86	216
COLORADO	36	17	35	88
CONNECTICUT	49	9	7	65
DELAWARE	4	4	2	10
DIST. OF COL.	4	3	2	9
FLORIDA	36	42	35	113
GEORGIA	174	123	119	416
HAWAII	2	2	3	7
IDAHO	26	15	23	64
ILLINOIS	81	137	346	564
INDIANA	15	39	41	95
IOWA	191	76	182	449
KANSAS	118	90	121	329
KENTUCKY	43	83	107	233
LOUISIANA	32	31	137	200
MAINE	17	8	21	46
MARYLAND	9	36	25	70
MASSACHUSETTS	29	18	21	68
MICHIGAN	11	27	70	108
MINNESOTA	3	43	142	188
MISSISSIPPI	40	98	51	189
MISSOURI	238	100	47	385
MONTANA	61	4	17	82
NEBRASKA	96	102	141	339
NEVADA	7	7	3	17
NEW HAMPSHIRE	42	5	22	69
NEW JERSEY	88	12	15	115
NEW MEXICO	2	5	25	32
NEW YORK	281	87	137	505
NORTH CAROLINA	142	44	52	238
NORTH DAKOTA	5	25	52	82
OHIO	84	161	93	338
OKLAHOMA	7	30	7	44
OREGON	97	8	38	143
PENNSYLVANIA	205	101	11	317
RHODE ISLAND	13	4	3	20
SOUTH CAROLINA	46	18	41	105
SOUTH DAKOTA	38	34	44	116
TENNESSEE	262	145	189	596
TEXAS	23	78	162	263
UTAH	25	11	8	44
VERMONT	53	7	34	94
VIRGINIA	41	22	66	129
WASHINGTON	27	24	54	105
WEST VIRGINIA	92	15	20	127
WISCONSIN	175	29	181	385
WYOMING	1	21	13	35
PUERTO RICO	0	4	1	5
TOTAL	3569	2235	3180	8984

TABLE 2B

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
MANDATORY 15 PERCENT OFF-SYSTEM - 117
AS OF DECEMBER 31, 1984

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	15	117	111	243
ALASKA	2	0	2	4
ARIZONA	1	3	14	18
ARKANSAS	15	38	35	88
CALIFORNIA	51	26	36	113
COLORADO	24	3	4	31
CONNECTICUT	11	2	4	17
DELAWARE	6	6	2	14
DIST. OF COL.	0	0	0	0
FLORIDA	54	22	31	107
GEORGIA	131	88	64	283
HAWAII	3	1	2	6
IDAHO	7	2	18	27
ILLINOIS	58	100	489	647
INDIANA	14	16	31	61
IOWA	55	57	140	252
KANSAS	6	74	78	158
KENTUCKY	53	41	50	144
LOUISIANA	146	139	61	346
MAINE	7	12	19	38
MARYLAND	21	17	19	57
MASSACHUSETTS	1	5	1	7
MICHIGAN	6	10	40	56
MINNESOTA	0	28	186	214
MISSISSIPPI	5	50	35	90
MISSOURI	193	34	27	254
MONTANA	45	1	11	57
NEBRASKA	150	58	42	250
NEVADA	5	1	7	13
NEW HAMPSHIRE	15	4	14	33
NEW JERSEY	34	5	1	40
NEW MEXICO	2	1	13	16
NEW YORK	188	35	52	275
NORTH CAROLINA	99	51	17	167
NORTH DAKOTA	0	18	31	49
OHIO	10	47	68	125
OKLAHOMA	0	8	2	10
OREGON	40	7	37	84
PENNSYLVANIA	107	69	7	183
RHODE ISLAND	5	4	3	12
SOUTH CAROLINA	38	12	25	75
SOUTH DAKOTA	0	16	25	41
TENNESSEE	77	4	18	99
TEXAS	72	70	92	234
UTAH	10	7	11	28
VERMONT	11	9	42	62
VIRGINIA	19	18	53	90
WASHINGTON	40	28	63	131
WEST VIRGINIA	37	14	6	57
WISCONSIN	97	35	105	237
WYOMING	12	1	8	21
PUERTO RICO	0	0	2	2
TOTAL	1998	1414	2254	5666

TABLE 2C

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
OPTIONAL 20 PERCENT ON/OFF-SYSTEM - 114
AS OF DECEMBER 31, 1984

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	54	54	37	145
ALASKA	8	2	0	10
ARIZONA	3	2	5	10
ARKANSAS	13	9	26	48
CALIFORNIA	12	12	25	49
COLORADO	8	2	3	13
CONNECTICUT	3	0	1	4
DELAWARE	0	1	0	1
DIST. OF COL.	5	3	0	8
FLORIDA	7	16	9	32
GEORGIA	16	39	31	86
HAWAII	1	0	0	1
IDAHO	7	3	9	19
ILLINOIS	22	42	261	325
INDIANA	0	11	12	23
IOWA	39	144	131	314
KANSAS	10	75	56	141
KENTUCKY	50	60	61	171
LOUISIANA	56	56	20	132
MAINE	1	10	8	19
MARYLAND	0	7	5	12
MASSACHUSETTS	6	7	1	14
MICHIGAN	6	25	49	80
MINNESOTA	0	43	59	102
MISSISSIPPI	4	44	39	87
MISSOURI	21	21	16	58
MONTANA	36	6	8	50
NEBRASKA	8	45	32	85
NEVADA	2	0	3	5
NEW HAMPSHIRE	23	5	7	35
NEW JERSEY	3	3	0	6
NEW MEXICO	1	0	4	5
NEW YORK	36	22	46	104
NORTH CAROLINA	68	27	11	106
NORTH DAKOTA	0	22	28	50
OHIO	0	21	51	72
OKLAHOMA	0	11	3	14
OREGON	23	15	23	61
PENNSYLVANIA	25	20	2	47
RHODE ISLAND	2	0	0	2
SOUTH CAROLINA	21	14	38	73
SOUTH DAKOTA	1	13	26	40
TENNESSEE	154	49	83	286
TEXAS	17	27	15	59
UTAH	6	4	7	17
VERMONT	36	2	17	55
VIRGINIA	24	13	37	74
WASHINGTON	26	6	6	38
WEST VIRGINIA	19	11	4	34
WISCONSIN	127	18	95	240
WYOMING	10	2	5	17
PUERTO RICO	2	0	2	4
TOTAL	1022	1044	1417	3483

TABLE 3

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Alabama	Cochrane	$ 0.608	$ 1.200	$ 1.520			$ 6.735	$ 27.544
	Claiborne-Murphy				$ 0.640	$ 7.315		
Alaska	Gastineau & Kowee Cr.	20.369						
California	Golden Gate	1.000	2.549	15.300	26.012	10.200		
	San Mateo		0.720	4.000	2.159			
	Russian Rv. @ Preston					0.520	0.200	1.957
	Mission Bay Channel							10.100
Colorado	Colfax-Larimar Viaduct				6.080	13.628	13.290	18.820
Delaware	Augustine Cutoff		6.007					
	US 113 over St. Jones River				9.164			
Dis. of Col.	Key Bridge				0.500	1.360		16.000
Florida	Barron Collier		10.020					
Georgia	Torras Causeway		1.600		19.400			
Idaho	Sandpoint	9.600						
	Bonners Ferry				8.173			0.527

TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS)						
		FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Illinois	Miss. Rv. @ Quincy	$ 0.400	$ 0.800	$ 1.360	$ 7.100	$ 26.200		$ 1.770
	US 36 @ Florence	1.250						
	Pekin	11.400		3.600				
	Franklin St. Bridge					1.280		
	LaSalle-Peru Bridge					10.380	$ 30.900	
	Staley Viaduct						1.200	
Iowa/ Wisconsin	Eagle Point	5.600	23.700	0.053				
Iowa/ Illinois	Keokuk	0.360	0.440	7.856		10.193		0.234
Iowa/ Nebraska	Missouri Rv. @ Sioux City	2.723	0.400					
Iowa	MacArthur Bridge					0.500		0.444
Kansas/ Missouri	US 36/Mo. River	8.002	5.626	1.958	2.189			
Kansas	West Kansas Ave.					6.250	12.036	

TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS)						
		FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Maine	Million Dollar	$ 0.400		$ 0.400				
	Wiscasset-Edgecomo		$ 2.500	3.700		$ 0.240		
Maryland	South River		17.433					
Mass.	Fore River	0.060						
Michigan	Third Street		1.824		$ 0.151		$ 20.800	
	MacArthur Bridge				10.720			
Minnesota	High Bridge						1.724	$ 1.426
Mississippi	Natchez-Vidalia	1.680		8.000			13.157	22.400
	Escatawpa River						5.948	
	Fort Bayou Bridge					8.320	0.500	
Missouri	US 67	15.684	2.391					
	US 54/Grand Glaize				6.185	1.371		
	ASB		8.620	0.478	5.261	10.862	5.500	3.800
Montana	Warden					2.736		
Nebraska/ Iowa	Nebraska City				0.565	8.015	1.355	1.040

TABLE 5 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
New Jersey	Rte. 22WB/Waverly Yards				$ 0.480	$ 11.200		
	Pulaski Skyway						$ 11.200	$ 0.816
New York	South Park Avenue	$ 8.571						
	Queensboro	1.335		$ 18.588	28.125	8.800	0.496	37.664
	Manhattan	2.152			5.464	0.736	27.832	2.800
	Little Falls	3.350						
	Brooklyn					5.438	3.100	
New York/ Vermont	Rouses Point			0.400	1.016			20.856
North Car.	US 421				10.400			
North Dak.	Bismarck Mem.			1.850	10.950			
Ohio	Northfield Rd. Br.					5.490		
	North Main St. Viaduct	18.400	$ 7.480					
	Main Ave. Bridge						3.615	
	Hopple St. Viaduct							10.400

TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Oregon	Center Street	$ 0.720	$ 0.320	$ 15.400	$ 0.480			
Penn.	Bloomfield	2.880	6.640	8.640		$ 1.840	$ 5.800	
	Rochester-Monaca				2.400			$ 14.000
	Passyunk Avenue	30.000						
	Minsi Trail				9.880		4.000	
	Beaver Falls		0.800	11.520	0.560			
	Monongahela Rv.					0.400	0.900	12.800
	Towanda					1.000	9.000	
Rhode Is.	Jamestown	0.080	2.938		0.400	0.400	40.000	
South Car.	Hilton head, Skull & Mackey Cr.	2.500	13.386					
	Sampit River		1.000	11.040				1.900
	James Island			4.400	1.760			
Tennessee	Sidney Lewis Br.					11.400		
	Walnut Street				16.000			
	Alvin York Br.						0.575	9.280

TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1984

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Texas	Brazos Rv. Div. Channel		$ 8.400					
Virginia	James River	$ 8.300	16.000	$ 1.120				
	Nansemond River	3.353						
	Robert E. Lee Br.					$ 2.000		
Washington	Swinomish Channel	8.190	2.087	1.103				
	Pasco-Kennewick	1.729						
	West Seattle			60.000				
West Va./ Ohio	Weirton/ Steubenville				$ 8.000	18.062	$ 16.500	
Wisconsin/ Minnesota	Arrowhead	13.320	31.820	7.868	3.657	2.300	0.607	
	TOTAL	$183.816	$176.701	$190.154	$200.871	$188.436	$240.970	$216.572

TABLE 4A

COUNT OF DEFICIENT BRIDGES BY STATE
ON FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1984

	BRIDGES IN INVENTORY	NON-DEFICIENT BRIDGES	STRUCTURALLY DEFICIENT	FUNCTIONALLY OBSOLETE	DEFICIENT BRIDGES
ALABAMA	7,610	4,521	1,234	1,855	3,089
ALASKA	569	511	41	17	58
ARIZONA	4,384	4,196	70	118	188
ARKANSAS	5,806	3,719	365	1,722	2,087
CALIFORNIA	14,803	12,520	480	1,803	2,283
COLORADO	3,450	2,855	392	203	595
CONNECTICUT	2,571	998	406	1,167	1,573
DELAWARE	444	398	26	20	46
DIST. OF COL.	223	177	43	3	46
FLORIDA	5,538	4,198	152	1,188	1,340
GEORGIA	7,798	4,970	821	2,007	2,828
HAWAII	656	523	86	47	133
IDAHO	1,661	1,409	183	69	252
ILLINOIS	10,421	8,319	1,574	528	2,102
INDIANA	7,039	3,689	977	2,373	3,350
IOWA	7,028	4,688	847	1,493	2,340
KANSAS	10,619	6,799	1,005	2,815	3,820
KENTUCKY	4,852	3,511	329	1,012	1,341
LOUISIANA	5,612	3,815	901	896	1,797
MAINE	1,257	1,050	127	80	207
MARYLAND	2,523	1,758	345	420	765
MASSACHUSETTS	3,597	2,669	880	48	928
MICHIGAN	5,750	4,680	808	262	1,070
MINNESOTA	5,020	4,078	492	450	942
MISSISSIPPI	7,456	4,048	1,728	1,680	3,408
MISSOURI	8,580	5,242	735	2,603	3,338
MONTANA	2,504	974	166	1,364	1,530
NEBRASKA	5,081	3,698	738	645	1,383
NEVADA	762	667	6	89	95
NEW HAMPSHIRE	1,202	875	168	159	327
NEW JERSEY	3,976	2,797	786	393	1,179
NEW MEXICO	2,849	2,412	291	146	437
NEW YORK	8,898	4,232	3,825	841	4,666
NORTH CAROLINA	5,275	3,153	517	1,605	2,122
NORTH DAKOTA	1,671	1,253	190	228	418
OHIO	12,151	10,309	1,616	226	1,842
OKLAHOMA	7,546	6,061	770	715	1,485
OREGON	4,011	3,428	334	249	583
PENNSYLVANIA	10,875	7,954	2,243	678	2,921
RHODE ISLAND	563	468	76	19	95
SOUTH CAROLINA	4,198	3,415	219	564	783
SOUTH DAKOTA	2,785	2,398	184	203	387
TENNESSEE	7,114	4,358	1,205	1,551	2,756
TEXAS	25,152	20,287	1,049	3,816	4,865
UTAH	1,417	1,312	75	30	105
VERMONT	1,289	837	145	307	452
VIRGINIA	6,788	5,311	586	891	1,477
WASHINGTON	3,935	3,018	347	570	917
WEST VIRGINIA	3,351	1,888	983	480	1,463
WISCONSIN	6,218	3,694	1,695	829	2,524
WYOMING	1,895	1,760	40	95	135
PUERTO RICO	876	553	88	237	325
TOTAL	267,657	192,459	33,389	41,809	75,198

TABLE 4B

COUNT OF DEFICIENT BRIDGES BY STATE
OFF FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1984

	BRIDGES IN INVENTORY	NON-DEFICIENT BRIDGES	STRUCTURALLY DEFICIENT	FUNCTIONALLY OBSOLETE	DEFICIENT BRIDGES
ALABAMA	7,903	2,471	3,362	2,070	5,432
ALASKA	286	158	84	24	108
ARIZONA	756	559	110	87	197
ARKANSAS	8,530	1,925	1,666	4,939	6,605
CALIFORNIA	7,457	3,610	1,126	2,721	3,847
COLORADO	3,697	1,270	2,058	369	2,427
CONNECTICUT	1,153	483	313	357	670
DELAWARE	247	181	25	41	66
DIST. OF COL.	13	13	0	0	0
FLORIDA	4,467	2,909	650	908	1,558
GEORGIA	6,393	2,769	2,890	734	3,624
HAWAII	382	231	35	116	151
IDAHO	1,981	970	531	460	991
ILLINOIS	14,637	8,496	4,138	2,003	6,141
INDIANA	10,843	3,591	3,667	3,385	7,052
IOWA	19,084	7,211	5,074	6,199	11,273
KANSAS	15,037	4,305	5,093	5,639	10,732
KENTUCKY	7,032	3,420	1,993	1,819	3,812
LOUISIANA	8,603	2,914	3,576	2,113	5,689
MAINE	1,335	738	310	287	597
MARYLAND	1,536	821	217	498	715
MASSACHUSETTS	1,179	515	631	33	664
MICHIGAN	4,645	2,186	2,053	406	2,459
MINNESOTA	7,886	4,675	1,395	1,816	3,211
MISSISSIPPI	9,272	2,357	5,848	1,067	6,915
MISSOURI	15,146	2,361	4,848	7,937	12,785
MONTANA	2,273	421	683	1,169	1,852
NEBRASKA	11,116	2,368	6,876	1,872	8,748
NEVADA	249	175	28	46	74
NEW HAMPSHIRE	1,369	345	422	582	1,004
NEW JERSEY	1,756	975	498	283	781
NEW MEXICO	571	308	151	112	263
NEW YORK	8,521	1,669	5,706	1,148	6,852
NORTH CAROLINA	10,437	2,255	4,490	3,692	8,182
NORTH DAKOTA	3,804	1,054	1,957	793	2,750
OHIO	16,818	12,383	2,919	1,536	4,455
OKLAHOMA	14,475	3,942	7,794	2,739	10,533
OREGON	2,858	1,875	372	611	983
PENNSYLVANIA	10,864	6,181	3,897	1,566	4,663
RHODE ISLAND	126	79	33	14	47
SOUTH CAROLINA	4,692	3,378	897	417	1,314
SOUTH DAKOTA	4,278	1,455	943	1,878	2,821
TENNESSEE	10,998	4,514	4,775	1,707	6,482
TEXAS	18,884	6,109	7,333	5,442	12,775
UTAH	954	628	236	90	326
VERMONT	1,365	612	306	647	953
VIRGINIA	5,705	2,868	531	2,306	2,837
WASHINGTON	2,861	1,996	334	531	865
WEST VIRGINIA	3,257	863	1,726	668	2,394
WISCONSIN	6,604	2,772	2,629	1,203	3,832
WYOMING	956	342	315	299	614
PUERTO RICO	781	525	77	179	256
TOTAL	305,388	121,411	107,419	77,558	184,977

TABLE 5A

COUNT OF OPEN, CLOSED AND POSTED BRIDGES
ON FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1984

	BRIDGES IN INVENTORY	OPEN - NOT REQUIRING LOAD POSTING	CLOSED BRIDGES	POSTED BRIDGES	OPEN - SHOULD BE POSTED BUT ARE NOT POSTED
ALABAMA	7,818	3,698	26	194	3,692
ALASKA	569	532	2	18	17
ARIZONA	4,384	4,331	7	17	29
ARKANSAS	5,498	4,976	28	382	420
CALIFORNIA	14,803	14,682	25	72	24
COLORADO	3,450	3,302	3	128	17
CONNECTICUT	2,571	2,428	6	104	33
DELAWARE	444	420	2	21	1
DIST. OF COL.	223	172	2	44	5
FLORIDA	5,538	5,335	6	112	85
GEORGIA	7,798	7,229	3	252	314
HAWAII	656	603	0	52	1
IDAHO	1,661	1,457	3	201	0
ILLINOIS	10,421	9,754	49	283	335
INDIANA	7,039	6,235	19	312	473
IOWA	7,028	6,111	14	680	223
KANSAS	10,819	7,877	168	2,297	277
KENTUCKY	4,852	4,578	4	271	1
LOUISIANA	5,612	4,766	5	296	545
MAINE	1,257	1,228	1	26	10
MARYLAND	2,523	2,355	1	52	115
MASSACHUSETTS	3,597	3,054	80	438	45
MICHIGAN	5,756	5,194	12	492	58
MINNESOTA	5,020	4,778	5	203	42
MISSISSIPPI	7,456	3,581	11	3,838	46
MISSOURI	8,580	6,164	9	1,970	437
MONTANA	2,504	2,313	0	49	142
NEBRASKA	5,081	3,062	4	816	1,199
NEVADA	762	759	0	3	0
NEW HAMPSHIRE	1,202	1,158	3	40	1
NEW JERSEY	3,976	3,548	21	340	67
NEW MEXICO	2,849	2,807	2	38	2
NEW YORK	8,898	8,707	12	179	0
NORTH CAROLINA	5,275	4,374	13	870	18
NORTH DAKOTA	1,671	1,391	0	73	207
OHIO	12,151	11,322	27	582	220
OKLAHOMA	7,546	6,658	6	223	459
OREGON	4,011	3,798	8	98	107
PENNSYLVANIA	10,875	10,101	15	338	421
RHODE ISLAND	563	535	2	25	1
SOUTH CAROLINA	4,198	4,081	5	112	0
SOUTH DAKOTA	2,785	2,480	0	35	270
TENNESSEE	7,114	6,702	18	250	152
TEXAS	25,152	24,450	1	487	214
UTAH	1,617	1,328	8	26	55
VERMONT	1,289	1,243	1	45	0
VIRGINIA	6,788	6,210	6	569	3
WASHINGTON	3,935	3,420	3	74	38
WEST VIRGINIA	3,351	2,835	9	404	103
WISCONSIN	6,218	6,134	25	43	16
WYOMING	1,895	1,855	0	33	7
PUERTO RICO	878	861	8	17	0
TOTAL	267,657	237,534	652	18,924	10,947

TABLE 5B

COUNT OF OPEN, CLOSED AND POSTED BRIDGES
OFF FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1984

	BRIDGES IN INVENTORY	OPEN - NOT REQUIRING LOAD POSTING	CLOSED BRIDGES	POSTED BRIDGES	OPEN - SHOULD BE POSTED BUT ARE NOT POSTED
ALABAMA	7,903	3,817	56	894	3,138
ALASKA	206	160	28	25	53
ARIZONA	756	607	19	59	71
ARKANSAS	8,530	3,362	86	787	4,295
CALIFORNIA	7,457	6,701	24	573	159
COLORADO	3,697	1,706	27	1,951	13
CONNECTICUT	1,153	980	23	151	79
DELAWARE	247	179	1	64	3
DIST. OF COL.	13	12	0	1	0
FLORIDA	4,467	3,398	29	542	498
GEORGIA	6,393	3,163	59	736	2,435
HAWAII	382	293	1	59	29
IDAHO	1,981	1,246	8	707	0
ILLINOIS	14,637	9,932	498	2,256	1,951
INDIANA	10,643	4,038	140	2,539	3,926
IOWA	19,084	8,726	266	8,389	1,703
KANSAS	15,037	6,136	411	6,908	1,682
KENTUCKY	7,632	6,284	75	1,058	215
LOUISIANA	8,603	3,278	45	1,207	4,073
MAINE	1,335	1,026	8	87	214
MARYLAND	1,536	912	13	281	330
MASSACHUSETTS	1,179	648	72	433	26
MICHIGAN	4,645	2,418	213	1,897	117
MINNESOTA	7,888	6,082	87	1,558	159
MISSISSIPPI	9,272	3,465	87	5,628	92
MISSOURI	15,148	11,913	232	2,846	155
MONTANA	2,273	991	6	519	757
NEBRASKA	11,116	1,698	126	6,300	2,992
NEVADA	249	218	1	19	11
NEW HAMPSHIRE	1,349	758	47	491	53
NEW JERSEY	1,796	1,095	40	560	61
NEW MEXICO	571	386	4	172	9
NEW YORK	8,521	6,746	86	1,689	0
NORTH CAROLINA	10,437	3,392	41	6,934	70
NORTH DAKOTA	3,804	1,403	62	985	1,394
OHIO	18,818	9,730	154	5,756	1,178
OKLAHOMA	14,475	11,941	93	2,353	88
OREGON	2,838	2,411	10	273	144
PENNSYLVANIA	10,644	7,013	181	3,025	625
RHODE ISLAND	126	92	5	27	2
SOUTH CAROLINA	4,692	3,812	39	841	0
SOUTH DAKOTA	4,276	1,953	43	4	2,276
TENNESSEE	10,996	7,548	150	837	2,461
TEXAS	18,884	16,743	97	2,032	12
UTAH	954	590	24	92	248
VERMONT	1,365	1,285	8	160	8
VIRGINIA	5,705	3,283	9	2,495	8
WASHINGTON	2,881	2,422	20	317	102
WEST VIRGINIA	3,257	1,700	45	1,481	31
WISCONSIN	6,604	5,455	50	1,092	7
WYOMING	956	401	19	143	393
PUERTO RICO	781	768	4	9	0
TOTAL	306,388	184,156	3,842	79,832	38,558

APPENDIX A

CODE OF FEDERAL REGULATIONS

23 HIGHWAYS - PART 650

Subpart D—Highway Bridge Replacement and Rehabilitation Program

§ 650.401 Purpose.

The purpose of this regulation is to prescribe policies and outline procedures for administering the Highway Bridge Replacement and Rehabilitation Program in accordance with 23 U.S.C. 144.

§ 650.403 Definitions of terms.

(a) *Bridge.* A structure, including supports, erected over a depression or an obstruction, such as water, a highway, or a railway, having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of the openings for multiple boxes; it may include multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening.

(b) *Sufficiency rating.* The numerical rating of a bridge based on its structural adequacy and safety, essentiality for public use, and its serviceability and functional obsolescence.

(c) *Rehabilitation.* The major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects.

§ 650.405 Eligible projects.

(a) *General.* Deficient highway bridges on all public roads may be eligible for replacement or rehabilitation.

(b) *Types of projects which are eligible.* The following types of work are eligible for participation in the Highway Bridge Replacement and Rehabilitation Program (HBRRP), hereinafter known as the bridge program.

(1) *Replacement.* Total replacement of a structurally deficient or functionally obsolete bridge with a new facility constructed in the same general traffic corridor. A nominal amount of approach work, sufficient to connect the new facility to the existing roadway or to return the gradeline to an attainable touchdown point in accordance with good design practice is also eligible. The replacement structure must meet the current geometric, construction and structural standards required for the types and volume of projected traffic on the facility over its design life.

(2) *Rehabilitation.* The project requirements necessary to perform the major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects are eligible except as noted under ineligible work. Bridges to be rehabilitated both on or off the F-A System shall, as a minimum, conform with the provisions of 23 CFR Part 625, Design Standards for Federal-aid Highways, for the class of highway on which the bridge is a part.

(c) *Ineligible work.* Except as otherwise prescribed by the Administrator, the costs of long approach fills, causeways, connecting roadways, interchanges, ramps, and other extensive earth structures, when constructed beyond the attainable touchdown point, are not eligible under the bridge program.

§ 650.407 Application for bridge replacement or rehabilitation.

(a) Agencies participate in the bridge program by conducting bridge inspections and submitting Structure Inventory and Appraisal (SI&A) sheet inspection data. Federal and local governments supply SI&A sheet data to the State agency for review and processing. The State is responsible for submitting the six computer card format or tapes containing all public road SI&A sheet bridge information through the Division Administrator of the Federal Highway Administration (FHWA) for processing. These requirements are prescribed in 23 CFR 660.309 and 660.311, the National Bridge Inspection Standards.

(b) Inventory data may be submitted as available and shall be submitted at such additional times as the FHWA may request.

(c) Inventory data on bridges that have been strengthened or repaired to eliminate deficiencies, or those that have been replaced or rehabilitated using bridge replacement and/or other funds, must be revised in the inventory through data submission.

(d) The Secretary may, at the request of a State, inventory bridges, on and off the Federal-aid system, for historic significance.

§ 650.409 Evaluation of bridge inventory.

(a) *Sufficiency rating of bridges.* Upon receipt and evaluation of the bridge inventory, a sufficiency rating will be assigned to each bridge by the Secretary in accordance with the approved AASHTO ' *sufficiency* rating formula. The sufficiency rating will be used as a basis for establishing eligibility and priority for replacement or rehabilitation of bridges, in general the lower the rating, the higher the priority.

(b) *Selection of bridges for inclusion in State program.* After evaluation of the inventory and assignment of sufficiency ratings, the Secretary will provide the State with a selection list of bridges within the State that are eligible for the bridge program. From that list or from previously furnished selection lists, the State may select bridge projects.

§ 650.411 Procedures for bridge replacement and rehabilitation projects.

(a) Consideration shall be given to projects which will remove from service highway bridges most in danger of failure.

(b) *Submission and approval of projects.* (1) Bridge replacement or rehabilitation projects shall be submitted by the State to the Secretary in accordance with 23 CFR Part 630 Subpart A Federal-Aid Programs, Approval and Authorization.

(2) Funds apportioned to a State shall be made available throughout each State on a fair and equitable basis.

(c)(1) Each approved project will be designed, constructed, and inspected for acceptance in the same manner as other projects on the system on which the project is located. It shall be the responsibility of the State agency to properly maintain, or cause to be properly maintained, any project constructed under this bridge program. The State highway agency shall enter into a formal agreement for maintenance with appropriate local government officials in cases where an eligible project is located within and is under the legal authority of such a local government.

(2) Whenever a deficient bridge is replaced or its deficiency alleviated by a new bridge under the bridge program, the deficient bridge shall either be dismantled or demolished or its use limited to the type and volume of traffic the structure can safely service over its remaining life. For example, if the only deficiency of the existing structure is inadequate roadway width and the combination of the new and existing structure can be made to meet current standards for the volume of traffic the facility will carry over its design life, the existing bridge may remain in place and be incorporporated into the system.

§ 650.413 Funding.

(a) Funds authorized for carrying out the Highway Bridge Replacement and Rehabilitation Program are available for obligation at the beginning of the fiscal year for which authorized and remain available for expenditure for the same period as funds apportioned for projects on the Federal-aid primary system.

(b) The Federal share payable on account of any project carried out under 23 U.S.C. 144 shall be 80 percent of the eligible cost.

(c) Not less than 15 percent nor more than 35 percent of the apportioned funds shall be expended for projects located on public roads, other than those on a Federal-aid system. The Secretary after consultation with State and local officials may, with respect to a State, reduce the requirement for expenditure for bridges not on a Federal-aid system when he determines that such State has inadequate needs to justify such expenditure.

§ 650.415 Reports.

The Secretary must report annually to the Congress on projects approved and current inventories together with recommendations for further improvements.

Effective Date:
December 13, 1979

APPENDIX B

CODE OF FEDERAL REGULATIONS

23 HIGHWAYS - PART 650

Subpart C—National Bridge Inspection Standards

§ 650.301 Application of standards.

The National Bridge Inspection Standards in this part apply to all structures defined as bridges located on all public roads. In accordance with the AASHTO (American Association of State Highway and Transportation Officials) Highway Definitions Manual, a "bridge" is defined as a structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

§ 650.303 Inspection procedures.

(a) Each highway department shall include a bridge inspection organization capable of performing inspections, preparing reports, and determining ratings in accordance with the provisions of the AASHTO Manual [1] and the Standards contained herein.

(b) Bridge inspectors shall meet the minimum qualifications stated in § 650.307.

[1] The "AASHTO Manual" referred to in this part is the "Manual for Maintenance Inspection of Bridges 1978" published by the American Association of State Highway and Transportation Officials. A copy of the Manual may be examined during normal business hours at the office of each Division Administrator of the Federal Highway Administration, at the office of each Regional Federal Highway Administrator and at the Washington Headquarters of the Federal Highway Administration. The addresses of these document inspection facilities are set forth in Appendix D to Part 7 of the regulations of the Office of the Secretary (49 CFR Part 7). In addition, a copy of the Manual may be secured upon payment in advance by writing to the American Association of State Highway and Transportation Officials, 444 N. Capitol Street, NW., Suite 225, Washington, D.C. 20001.

(c) Each structure required to be inspected under the Standards shall be rated as to its safe load carrying capacity in accordance with section 4 of the AASHTO Manual. If it is determined under this rating procedure that the maximum legal load under State law exceeds the load permitted under the Operating Rating, the bridge must be posted in conformity with the AASHTO Manual or in accordance with State law.

(d) Inspection records and bridge inventories shall be prepared and maintained in accordance with the Standards.

§ 650.305 Frequency of inspections.

(a) Each bridge is to be inspected at regular intervals not to exceed 2 years in accordance with section 3.3 of the AASHTO Manual.

(b) The depth and frequency to which bridges are to be inspected will depend on such factors as age, traffic characteristics, state of maintenance, and known deficiencies. The evaluation of these factors will be the responsibility of the individual in charge of the inspection program.

§ 650.307 Qualifications of personnel.

(a) The individual in charge of the organizational unit that has been delegated the responsibilities for bridge inspection, reporting, and inventory shall possess the following minimum qualifications:

(1) Be a registered professional engineer; or

(2) Be qualified for registration as a professional engineer under the laws of the State; or

(3) Have a minimum of 10 years experience in bridge inspection assignments in a responsible capacity and have completed a comprehensive training course based on the "Bridge Inspector's Training Manual," [1] which has been developed by a joint Federal-State task force.

(b) An individual in charge of a bridge inspection team shall possess the following minimum qualifications:

(1) Have the qualifications specified in paragraph (a) of this section; or

[1] The "Bridge Inspector's Training Manual" may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

(2) Have a minimum of 5 years experience in bridge inspection assignments in a responsible capacity and have completed a comprehensive training course based on the "Bridge Inspector's Training Manual," which has been developed by a joint Federal-State task force.

§ 650.309 Inspection report.

The findings and results of bridge inspections shall be recorded on standard forms. The data required to complete the forms and the functions which must be performed to compile the data are contained in section 3 of the AASHTO Manual.

§ 650.311 Inventory.

(a) Each State shall prepare and maintain an inventory of all bridge structures subject to the Standards. Under these Standards, certain structure inventory and appraisal data must be collected and retained within the various departments of the State organization for collection by the Federal Highway Administration as needed. A tabulation of this data is contained in the structure inventory and appraisal sheet distributed by the Federal Highway Administration as part of the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (Coding Guide) in January of 1979. Reporting procedures have been developed by the Federal Highway Administration.

(b) All bridges subject to these Standards shall be inventoried by December 31, 1980, as required by section 124(a), and (c) of the Surface Transportation Assistance Act of 1978. Newly completed structures or any modification of existing structures which would alter previously recorded data on the inventory forms shall be entered in the State's records within 90 days.

Effective Date: May 1, 1979

APPENDIX C

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 650

Bridges, Structures, and Hydraulics; Discretionary Bridge Criteria

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule

Subpart G—Discretionary Bridge Candidate Rating Factor

Sec.

650.701 Purpose.

650.703 Eligible projects for discretionary bridge funds.

650.705 Application for discretionary bridge funds.

650.707 Rating factor.

650.709 Special considerations.

Authority: 101, Pub. L. 97-424, 96 Stat. 2097; 23 U.S.C. 144, 315; 49 CFR 1.48(b).

Subpart G—Discretionary Bridge Candidate Rating Factor

§ 650.701 Purpose.

The purpose of this regulation is to describe a rating factor used as part of a selection process of allocation of discretionary bridge funds made available to the Secretary of Transportation under 23 U.S.C. 144.

§ 650.703 Eligible projects.

(a) Deficient highway bridges on Federal-aid highway system roads may be eligible for allocation of discretionary bridge funds to the same extent as they are for bridge funds apportioned under 23 U.S.C. 144, provided that the total project cost for a discretionary bridge candidate is at least $10 million or twice the amount of 23 U.S.C. 144 funds apportioned to the State during the fiscal year for which funding for the candidate bridge is requested.

(b) After the effective date of this regulation for the discretionary bridge candidate rating factor, only candidate bridges not previously selected with a computed rating factor of 100 or less will be eligible for consideration.

§ 650.705 Application for discretionary bridge funds.

Each year through its field offices the FHWA will issue an annual call for discretionary bridge candidate submittals including updates of previously submitted but not selected projects. Each State is responsible for submitting such data as required for candidate bridges. Data requested will include structure number, funds needed by fiscal year, total project cost, current average daily truck traffic and a narrative describing the existing bridge, the proposed new or rehabilitated bridge and other relevant factors which the State believes may warrant special consideration.

§ 650.707 Rating factor.

(a) The following formula is to be used in the selection process for ranking discretionary bridge candidates:

$$\text{Rating Factor (RF)} = \frac{SR}{D} \times \frac{TPC}{ADT'}$$

$$\times \left[1 + \frac{\text{Unobligated HBRRP Balance}}{\text{Total HBRRP Funds Received}}\right]$$

The lower the rating factor, the higher the priority for selection and funding.

(b) The terms in the rating factor are defined as follows:

SR is Sufficiency Rating computed as illustrated in Appendix A of the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges USDOT/FHWA (latest edition). (If SR is less than 1.0, use SR = 1.0).

ADT is Average Daily Traffic in thousands taking the most current value from the national bridge inventory data.

ADTT is Average Daily Truck Traffic in thousands (Pick up trucks and light delivery trucks not included).

For load posted bridges, the ADTT furnished should be that which would use the bridge if traffic were not restricted.

The ADTT should be the annual average volume, not peak or seasonal.

D is Defense Highway System Status:
D = 1 if not on defense highway.
D = 1.3 if bridge carries a designated defense highway.

The last term of the rating factor expression includes the State's unobligated balance of funds received under 23 U.S.C. 144 as of June 30 preceding the date of calculation, and the total funds received under 23 U.S.C. 144 for the last four fiscal years ending with the most recent fiscal year of the FHWA's annual call for discretionary bridge candidate submittals. (If unobligated HBRRP balance is less than $10 million, use zero balance.)

TPC is Total Project Cost in millions of dollars.

HBRRP is Highway Bridge Replacement and Rehabilitation Program.

ADT' is ADT plus ADTT.

(c) In order to balance the relative importance of candidate bridges with very low (less than one) sufficiency ratings and very low ADT's against candidate bridges with high ADT's, the minimum sufficiency rating used will be 1.0. If the computed sufficiency rating for a candidate bridge is less than 1.0, use 1.0 in the rating factor formula.

(d) If the unobligated balance of HBRRP funds for the State is less than $10 million, the HBRRP modifier is 1.0. This will limit the effect of the modifier on those States with small apportionments or those who may be accumulating funds to finance a major bridge.

§ 650.709 Special considerations.

(a) The selection process for new discretionary bridge projects will be based upon the rating factor priority ranking. However, although not specifically included in the rating factor formula, special consideration will be given to bridges that are closed to all traffic or that have a load restriction of less than 10 tons. Consideration will also be given to bridges with other unique situations, and to bridge candidates in States which have not previously been allocated discretionary bridge funds.

(b) The need to administer the program from a balanced national perspective requires that the special cases set forth in paragraph (a) of this section and other unique situations be considered in the discretionary bridge candidate evaluation process.

(c) Priority consideration will be given to the continuation and completion of bridge projects previously begun with discretionary bridge funds.